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The Effect of Gravity on Building Construction

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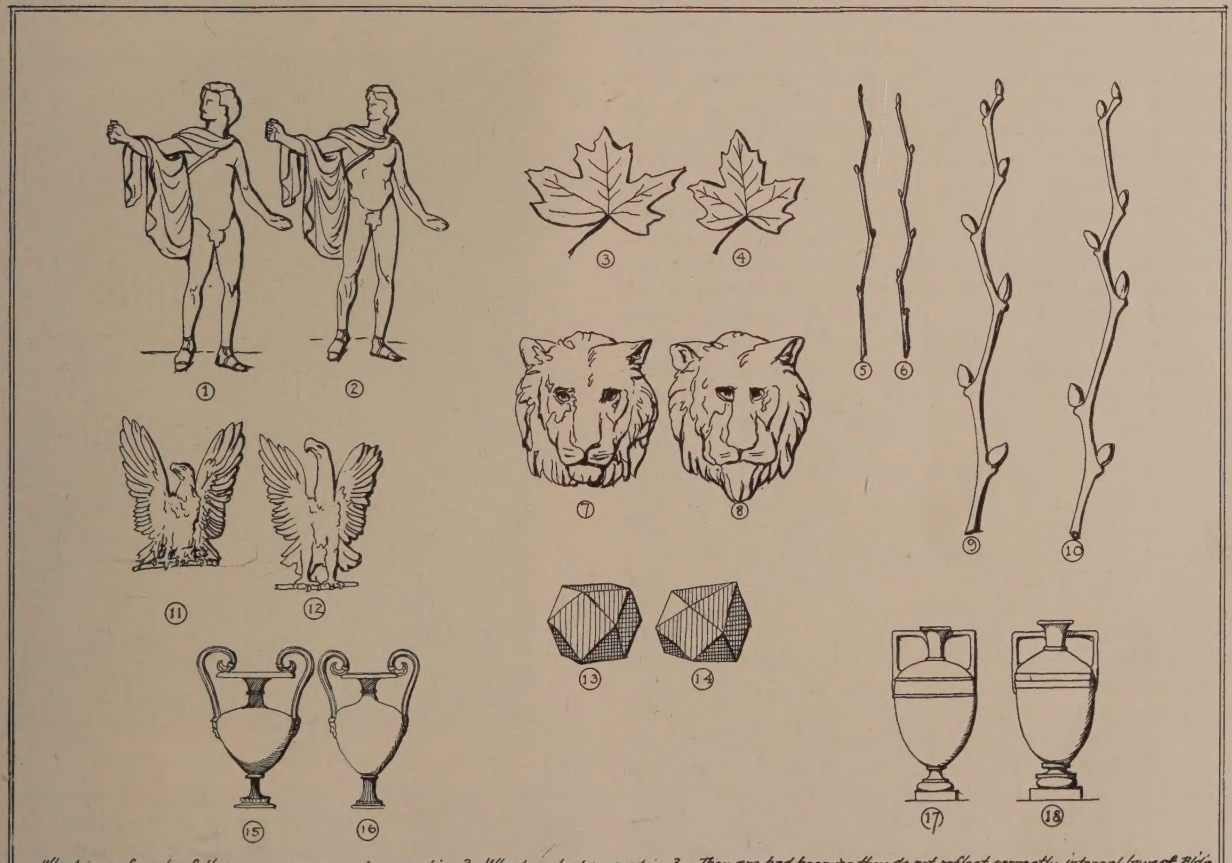
ARTICLE IX

CONCLUSIONS

PERHAPS by this time the mind of the reader who has followed these articles is convinced that man's ability to construct has been dependent upon his knowledge of the action of the force which we call gravity. Living in the kind of world that he does, he has to accept its laws and make the best of them. The nearer he came to understanding the operations of the law of gravity, the more freedom he had in inventing new methods of construction. But no matter how he tried to be original, he was obliged to keep that originality within the law, or else his building would not stand up.

In the beginning he took pride in conquering the force of gravity with muscle and physical energy. His great monuments were constructed of huge stones, that required the combined power of hundreds of human slaves to lift into position. The impression of greatness was given to these ancient buildings by the tremendous size of the blocks raised to position in the structure.

Later the builder became more interested in combating the force of gravity with his intellect. His structures show him interested in problems of clever balancing of internal parts and ornamental treatment. Out of his intellectual struggle he invented four systems of construction—the skeleton, the simple block, the balanced block, and the co-



hesive, all of which we described in an early article of the series. But these methods of building were based upon very simple observations of the action of gravity.

With the advent of those human minds which were in-

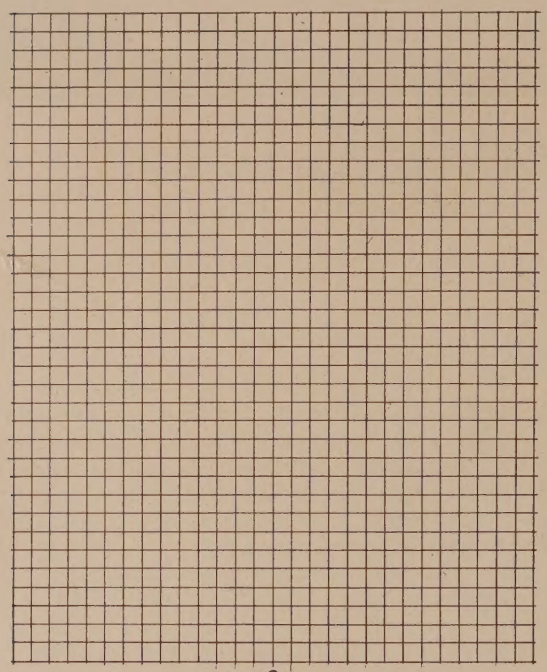


Chart ①

terested in ferreting out the principles of nature, more and more light was thrown upon the force which we call gravity. Gradually the very idea of an invisible force began to be captured and made graphic. The great minds built up a symbolism by which ordinary minds could visualize the mysterious power which attracted everything to the earth, and which pulled down every building that did not conform to its dictates. Means of measuring its effect were established, a system of reasoning about it was developed, large numbers of experiments were tried, and the results tabulated and conclusions arrived at from the information gathered together. What happened in the laboratory could be counted upon to happen in the field. A growing knowledge of the mechanics of materials permitted men to predict what would happen to a building before it was erected. Then a material of uniform quality was created. It was steel. Nature did not make materials of uniform quality throughout, but man could do it. He learned to produce steel that was strong, and of the same strength throughout the whole mass. If a cross-section bar of steel, 1 inch square, could suspend a load of 30,000 pounds without breaking, another bar of the same grade steel and of the same size could be depended upon to carry the same load. Then by the simple process of multiplication, it was found that one could predict accurately what a bar of steel, 4 square inches in cross-section, could carry. It was 4 times 30,000, or 120,000 pounds. This was a process of calculation that was not very certain when natural materials were used, for no one knew whether they were uniform in their internal make-up (in fact, it was certain they would not be), nor could one be sure that there was not hidden away somewhere within the vitals of the material a serious flaw. Stone columns and stone beams were treacherous, for they concealed internal weaknesses. Masonry walls were uncertain in strength because the mortar varied in quality, and the bricks were not equally burned. Concrete was not to be depended upon, for men used cement that nature produced, and it sometimes hardened quickly, sometimes slowly, was one time hard and another time crumbly.

A Man-Made Material Needed

Therefore the most powerful intellect in the world was unable to advance the art of construction by pure reasoning concerning the mechanics of structural parts, because the equations could not be balanced. The unknown treachery of materials was always lurking within the building units. *Not until steel was invented could the new knowledge be applied.* Not until Portland cement, with its remarkable uniformity of strength and time for hardening action, was manufactured could concrete be made that had some dependable strength. Not until it was discovered that Portland-cement concrete and steel worked sympathetically together could reinforced cohesive construction go forward to success. For if you are going to reason about a thing, your facts must be established, and your equations must balance.

Thus with a method of reasoning about the action of the force of gravity and materials of construction, which had uniform qualities of strength, men were made free to work out the designs of buildings with perfect assurance that they would stand up. Gradually the building took on a more organic structure, as men began to build with a more intimate knowledge of the ways of nature. The skeleton system grew in importance, since nature's method of building living organisms is to build them around a skeleton. Steel became the skeleton. Masonry blocks took on a secondary value; they were used merely as fillers between the framework. Indeed masonry was relegated to the work of acting as enclosing skin, and to-day our great buildings are

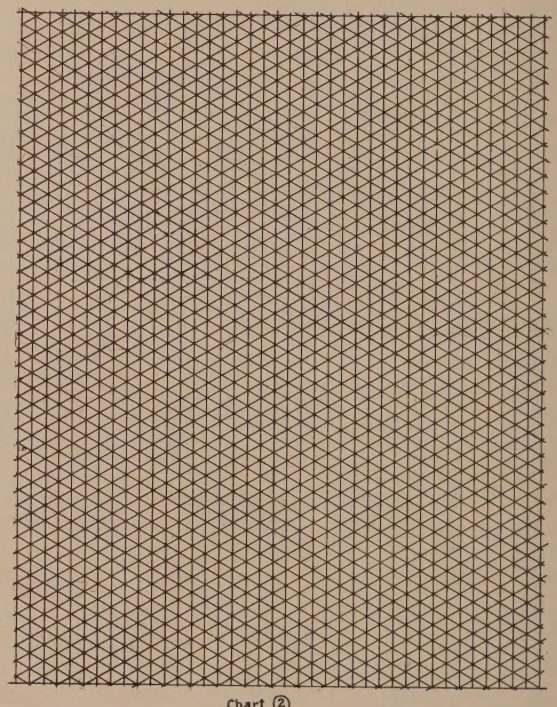


Chart ②

almost living things. Inside of them are the pipes, like blood-vessels, delivering warmth to all parts, and an interlacing of electric wires corresponds to the nervous system of the body.

Modern construction has been lifted out of the dead pile of building blocks to a living form of bone and flesh. We have discarded, forever, the childish way of piling up blocks, and have learned the ways of nature. We do not worry about building forever; we know that nature does not construct that way. We build our buildings for use, and when their days of usefulness are over they are torn down and room made for new and more useful structures. Buildings are born and die every day before they have rotted away.

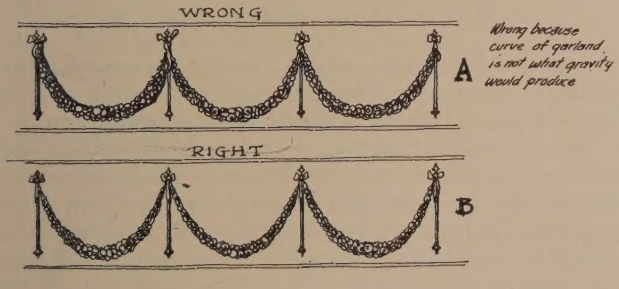
Modern Construction Nearer to Nature's Method than All Others. We Need to Study Nature More

Thus if our construction has come to be related more than ever to nature, so our architecture must tend in the same direction. In spite of the argument of certain individuals that architecture is a creation of man, and above and quite different from nature, the truth remains that nature is working through man, since he is but a product of her own creation. Men may protest, but they cannot get away from the world in which they live. Their bodies and their minds are nature's work, and what their minds create is built up from the lessons which they have learned from the world in which they move. I do not think that any sane producer or artist can truthfully deny this.

If my reader does not believe this, then I think we shall have to part company at this point. But if we can still go on together, I think he will see, with me, that architects need to go back to nature and study more carefully her principles of design, so that their ideas will keep pace with the development of construction.

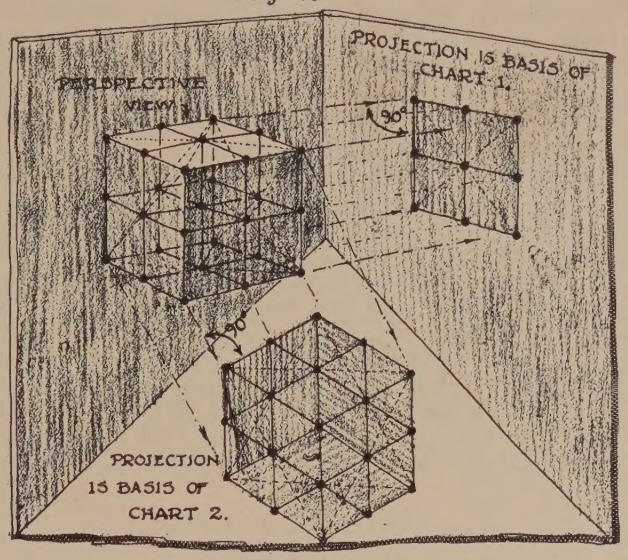
There ought not to be a difference of opinion existing between actual construction and architectural form. There is something wrong with the designer who says that such and such a building looks weak and unstable, when actually it is known to be very strong and stable. There is something wrong with his sense of porportion. Why should we feel it necessary to build an artificial base to a building at the ground-line, when we know definitely that the foundations of the building extend deep into the earth, like a living and growing tree? Are not our steel buildings like plants that take their root in the ground? Imagine nature building out fake bases at the ground-line around the bottoms of trees.

Does the thinness of the steel frame disturb the sense of durability and strength? Why should it? Only because we cover the outside of our frame structures with building blocks, and still think in the mechanics of primi-



tive men who built with such blocks. Nature does not cover her skeletons with little blocks, fastened with thousands of wires. She covers them with a plastic material, a flowing uniform substance that takes the general shape of the frame. If we would take a lesson from her, we would cover our buildings with a plastic material, like concrete, and forget all of the petty troubles of construction that we have when we try to hitch blocks of stone and hollow boxes of terra-cotta to a steel frame. Why, our architects have developed a condition of construction that will be the laugh-

Fig 12.



ing-stock of future generations. They have created designs that have to be pinned, hairpinned, and safety-pinned to the steel skeleton. Every now and then one of the pins gets loose, and a block of stone or crocket of terra-cotta falls to the street. I hope to live to see some one design a great steel building that is frankly covered with concrete applied to the steel in a manner that is in harmony with its plastic character (perhaps they will shoot it on with guns and model it like sculptor's clay). The stuff will stick, it will protect the steel, but, what is more important, it will reveal the general form of the frame, and so the architect will have to design the skeleton of the building to make it look beautiful, just as nature plans her skeletons. In spite of the saying that beauty is only skin-deep, the original form of the bony structure has a lot to do with it. A beautiful woman can be greatly marred by a diseased hip-bone, and many a nose would be quite handsome if it were not for the defective bone under the skin.

Proportion the Result of Construction

Now there is another thing that I hope to see realized. It is a better understanding of this problem of proportion in architecture. There is a lot of discussion about it, and a great deal of foolish talk. Yet the whole problem is based upon the training that nature gives man from his cradle. *Good proportion in nature is the result of the balancing of the force of gravity and the internal forces of construction, which we showed could not be so separated from the force of gravity.* Why do the plants, the crystals, and human forms have the proportions they do? Because they are the result of the action and reaction of forces which have equalized each other and have created a stable form.

There have been offered a lot of geometric ways of securing good proportions in architecture. There is Jay Hambidge's "Dynamic Symmetry," Frederick Macody's "Study of the Geometric Basis of Classic and Medieval Religious Architecture," Samuel Colman's "Study of Nature's Harmonic Unity," W. Watkins Lloyd's "Proportions

in Architectural Design," Gwilt's "Theory" in his Encyclopedia of Architecture, and many others.

They all try to prove that the Parthenon, or some other masterpiece of architecture, was a beautiful building, and the lines of their geometric patterns fall on the critical parts of the structure in a wonderful way. I have taken many of these theories and applied them to an ugly radiator or a steam-pipe valve, and they will work just as well as over a beautiful Greek vase.

The trouble with them is that none of the authors have realized that we live in a world that is built upon geometric patterns, for everything that is around us is the result of the balancing of internal forces, even our bodies, and as soon as you have a world built in such an orderly fashion as this, an orderly geometric pattern will fit it. I tried in one of the previous articles to show how even the tiniest building-blocks of nature were geometrically proportioned. If the world is built with such regularly shaped blocks, certainly it will be possible to find a trace of them everywhere. Now man, living in such a geometrically conceived and orderly world, cannot possibly make anything that does not reflect some of the world in which he exists. Why, even the hand with which he fashions his forms has its geometric limitations which will leave their trace upon his creations.

Charts for Design

If the reader will make two charts on transparent celluloid based upon the fundamental form of the atom, as described in a previous article (one of which would appear like a square cross-section paper and the other like a repetition of a hexagon in all directions; see illustrations), and if he will take these charts and try them over various forms, vases, flowers, buildings, and in fact anything, he will discover that they coincide with the forms in a most uncanny fashion. Lines and corners and intersections will fit so wonderfully well, that it would seem as if the creator of the forms had actually placed them over these charts when he was designing them. And that is just what he did do, unconsciously, for he was merely doing the kind of thing he had to do because he lived in that kind of a world.

Now I believe that these geometric patterns, based on the structure of the atom, used as the basis of a design, will help that design, because the designer will unconsciously express in his form more emphatically the structural unity of the world in which he lives. *But the subtilities of good proportion are not so simple.* Take for example a maple-leaf. Who can analyze how all of the forces were at work, and how they finally came to balance each other and produce the beautiful form of the leaf? There is no doubt that the leaf is based upon a geometric pattern, and one can get the main lines of it, but he cannot by compass, straight-edge, and ruler get at the subtilities of proportion in all the parts. If he wants to draw that leaf, he will have to draw it free-hand, and feel for the proportions. The geometry of structure is there, but it is so complicated, so subtle that the best that the brain can do is to sense and not to analyze it.

And so, after all, in the face of the fact that we have advanced far in our analysis of the action of gravity and are able to build as never before, and we are growing more and more intimate with nature and know her methods better than our forefathers, yet there does not seem to be much chance of finding her formula of beauty in all its entirety, for the more we know the wider the horizon of unknown facts widens out. Nevertheless, a recognition of the fact that we live in a world in which the forms are the results of the balancing of internal forces, is a big advance, for we then can see that the key to beauty of form *is a better expression of internal forces.* If the designer can catch the sense of the internal structure of a snowflake and then create a design that expresses the same sense, he will have gone far in the development of a beautiful thing. I am quite convinced that all great architecture, sculpture, and painting reflects unconsciously the fact that we live in a world of geometric orderliness. I am certain that when we talk of good proportion we mean that the form reflects correctly what nature would have done if she had produced that form by the orderly balancing of creative forces. I am certain that those designers who have a good sense of proportion have it because they are unusually sensitive to the underlying forces which produce things in nature. They feel gravity, they feel the attractive forces which bring the particles of matter together to make a plant, a crystal, or a living being.

Therefore I urge upon the reader again, as I did in the beginning of this series of articles, the value of studying the principles of the mechanics of building construction, in order that if he is a little dull in sensing the creative forces of nature, his wits may be sharpened by the process, and he will have a better understanding of fitting proportions, and of the problem of artistic designing.

South and West Junior High Schools, Colorado Springs, Colo.

(See Plates)

THESE two buildings have been erected from *the same floor plans*, but to give some individuality to each the exteriors have been designed in quite different styles, the South being of Spanish and the West of Tudor type. The patio in both buildings is treated in Spanish, with plastered walls relieved by tile inserts, and spouts and cornice.

The focus of the plan is the patio, 86 feet by 56 feet, with the auditorium placed to the south and the gymnasiums to the north. Ranged mainly along the east and west sides are the classrooms. The first floor contains four classrooms, shops, the sewing and domestic science departments, and gymnasiums for boys and girls. Between the gymnasiums are folding-doors, so that the two can be thrown together for exhibition games.

The second floor contains nine classrooms, a general science room, and library.

A part basement contains the boiler-room and fans. The patio is made possible of use, by the shelter it gives, for open-air meetings of the students or for entertainments.

In view of the experience that such schools are often more rapidly filled to capacity than can be foreseen, and that the necessity for more room so frequently arises, easy future extension has been anticipated, and can be accomplished by extending the east and west classroom portions, as indicated. Six classrooms can readily be added, and more if conditions demand.

These schools were executed under one contract and cost $468,355. The late firm of MacLaren & Hetherington were the architects; the designs being by Thomas MacLaren, Colorado Springs, in consultation with W. B. Ittner, of St. Louis.

Stretching the Centimes

Practical Ways of Economy in European Travel—Baggage, Etc.

By Gerald K. Geerlings

Illustrated by the Author

II

IF you are going abroad really to find and see architecture, consign all your intended baggage to a dry spot in your attic. Take it along and you will see no more of Europe than the average school-girl tourist. Not only will about 10 per cent of your expenses go on baggage fees (remember only a few countries allow any baggage allowance on your ticket, but charge for it separately), porters, vehicles, taxes, et cetera *ad infinitum*, but, in addition, hours of lost time at customs, railroad-stations, and in retracing strayed baggage. However, if you are desirous of determining the degree of aggravation necessary to commit murder or suicide, then take at least two trunks (one large), four handbags, one portable typewriter (for keeping your diary), and a T-square.

In spite of baggage impedimenta you can see Paris, Florence, Rome, and Naples. But you cannot see Provins, San Gimignano, Ravello, or Taormina. Carry only the personal effects and clothing which you vitally need in a small bag. Get a good, tough, expansive brief-case for sketching paraphernalia, and your trip will be a rollicking, royal good time. You can "hop" busses all over the place and easily see everything there is to see. Places most worth while are usually most inaccessible. Having only a bag and brief-case you can arrive at a new town, consult your guide-book map for the location of hotels, look them over, and make a selection. On the other hand, arriving at a railroad station loaded with baggage means selecting some hotel bus and being compelled to accept terms and room on arrival at the establishment. In Spain sometimes there is no other recourse, but in all other countries the towns are generally sufficiently near the station to admit of easily walking the extent of a hotel-inspection tour. Until you have grown gray and haggard with baggage worries you cannot conceive the sheer joy that comes from having only a single bag to pack when the only train all day departs in twelve and a half minutes!

In case you will be abroad for a long stay (fairy-tale luck) and a trunk is a necessary evil, try always personally to chaperon it across frontier customs. If you don't, you may see some of your things again, and maybe not—unless by chance you meet some of the customs inspector's relatives walking down the street. If the trunk must be left to its own devices, and must needs battle its own way through the customs, it is advisable to consign it to a native shipping agency from the town it leaves, to be sent "in bond" to a branch office in the city to which you wish it to go. With all due respect to the two main travel agencies, but still more for the probable size of your architectural wallet, I suggest native talent instead. In Paris go to "Fuller Freres, 8 Rue Faubourg-Poissoniere"; in Florence, to "King, David & Co., Piazza Santa Maria Novella" (branch office in London, I believe); Rome, "Bollinger," about two blocks to right of "Spanish Steps" as you face them. All these are related, and will call for your trunk, send it "in bond," be responsible and polite, and on top of all that charge next to nothing. We saw our trunk only about six times during the entire year, and then only to invest it with precious "loot." In sending it from Florence to Paris (while we were going up through Central Europe), including all cartage, freight, bonding, and storage charges for a month, the cost was about $6.70.

In all probability you will want to buy something for yourself, friends, or a client. Such purchases might be shipped back ahead of your return, accompanied by the all-important receipted bill. We tried that method from Portugal and Spain, but discovered to our dismay that some unscrupulous customs broker can swindle one out of any sum he chooses. For example, we prepaid a small box from Madrid to Philadelphia, paying a high rate of insurance as a safeguard. After several months we received word from the person to whom the box was consigned, to the effect that a customs broker had written a curt letter, demanding $15 or the contents of the box would be confiscated. The money was promptly forwarded, but another letter followed from the broker, demanding a larger sum for storage in the few days which had elapsed between letters. The contents were all certified antiques, and none of the money went to the government for duty. Although the box had originally been carefully packed, in repacking by the broker it had been so

badly done that a valuable wood-carved, sixteenth-century figure was broken, as well as a tile from the Casa di Miranda, Burgos. Yet by the time we had news of the mishaps and the swindle it was several months later, and nothing could be done about it. The individual seems unprotected from the exorbitant charges of the broker for doing nothing whatsoever.

Etruscan Gate, Perugia.

After our unfortunate consignments from Portugal and Spain, we followed a different course. We had decided to return by the Cunard line, and therefore sent all boxes to the Cunard baggage office, "in bond." We then took them back with us, saving the outrageous broker's swindle and criminal handling. Certainly there can be no such profitable business as a customs broker. It defies the law of not making something out of nothing. To illustrate: I sent a leather bag from Vienna to a friend in New York. I enclosed the receipted bill and prepaid all postage. It was a small package. Yet he was forced by a broker to pay more than the original cost (beside the United States duty) to a broker who extorted the payment under threat of confiscating the bag. On going to the United States customs officials he was informed that nothing could be done in the matter, even though he had the receipt proving all postage had been paid. Therefore, by all means send things "in bond" to your port of departure, and sail back with them if at all possible!

In Italy it is possible to obtain a "tessara," or permit to visit, free of charge, all governmental museums, galleries,

"monuments," etc. That nets a considerable saving and is worth while obtaining. It can be obtained through the "American Academy in Rome, Porta San Pancrazio, Rome," enclosing 20 lire and a statement from an art school, college, or university that at one time you were a bona fide student, or better still, a graduate. The same sort of thing sent to the "Minister of Education, Paris" (no fee to be enclosed), will result in an admission card which saves half the entrance fee to all places controlled by the government. In England it is possible to secure a card of introduction from the British Institute of Architects, addressing the secretary at "9, Conduit Street, London." They will send two cards, in fact, one for use on the Continent, and the other for use in England. One should, of course, send proper credentials from one's alma mater, chapter of the A. I. A., or something similar. The card serves as the "open-sesame" to almost all manor houses and private estates, at least to their gardens and grounds.

If it be possible to avoid being in Europe during the summer months of the American invasion, centimes will go 50 per cent further. France seems to fluctuate more than the other countries. Italy we found reasonable in spite of Holy Year. Florence in the heyday of Easter-time, when the whole world with all its relatives seemed to be there for the dove ceremony, is only half as expensive as any French town having its fling. As a general rule it is hardly worth the fig of paying fancy prices simply because a place is "in season." Constantinople is fashionable in November, but inexpensive in February and March, yet the weather is supposed to be about the same. Sicily, on the other hand, is one of the spots where the extra lire more than pay for seeing it in almond-blossom time. Go there in the early part of February by all means, when the rest of Europe is shivering. Around the 10th of that month Taormina is staging its picturesque annual fiesta, so that it may be advisable either to get there ahead of that date or make reservations. The Pensione Schuler has probably one of the most delightful small gardens in all of Europe, besides being ridiculously cheap for the food, view, and steam heat. Rates ran between 45 and 50 lire each per day when we were there.

In regard to sketching-materials it is important to boil down your outfit to what you actually will use. Don't drag around extensive oil or pastel materials unless you really will use them. Take water-color and pencil paper in sizes that are not an eternal bother to carry around. Before long you will find that, unless you make a sketch when you first see it, the likelihood of ever returning to do it later on is mighty slim. If your camera and sketching-outfit will easily fit in a brief-case and not be a burden to carry, the chances are pretty fair that you will have double the amount to show for the trip than if the materials had been more adequate but bulky, and had to repose at your hotel or pensione while you went out scouting for a subject.

A parting word about Spain. See it in the spring or autumn by all means if you can. Buy a mileage-book for your railroad travel after you have some sort of an idea of how many thousand kilos you will travel. Such a book saves endless trouble at stations, and about 35 per cent in money as well. When the hordes of beggars approach, put on your fiercest face and shout sternly: "Anda!" It seems to work after a little practice. It will save pesetas and annoyance while sketching.

In conclusion, remember that money has a different value abroad than here, and that you are entitled to the same value as any one else. Therefore, bargain like a native, don't use your mother tongue, carry no heavy baggage, have distinct price understandings with every one, and see what there is to see in a jovial, happy-go-lucky mood.

The one disadvantage of going abroad cheaply is this: after you return you will constantly be calculating all over envelopes, wall-paper, restaurant table-tops, and margins of drawings, the cost of going again!

How the Architect Can Save His Client Money

DEAR EDITOR:

Following up your fine editorial in the March issue entitled "Shoddy and Dangerous," as an architect specializing in the designing and supervising the construction of suburban houses I would like to add the following comments:

I feel personally that there is only one solution to this appalling problem; namely, the education of the public by the architect and good magazines.

Frequently I get in touch with a prospective client who has been very nearly sold to either the idea of buying a ready-built house or getting one built by some general contractor without the aid of an architect, having been told of the great saving to him by eliminating the architect's fees. My method of handling such cases is as follows: When my prospective client leans toward buying a ready-built house I present him with a copy of a little pamphlet, "Build or Buy," one of which I am enclosing for your consideration. I request my client to read over this pamphlet at his leisure when he leaves me, and I go on to enlarge on some of the points I have brought out in this little booklet, not forgetting to bring out the lack of design in many houses of this character.

My strong point is to get my prospective client thinking and make him sceptical as to the advisability of his proposed purchase.

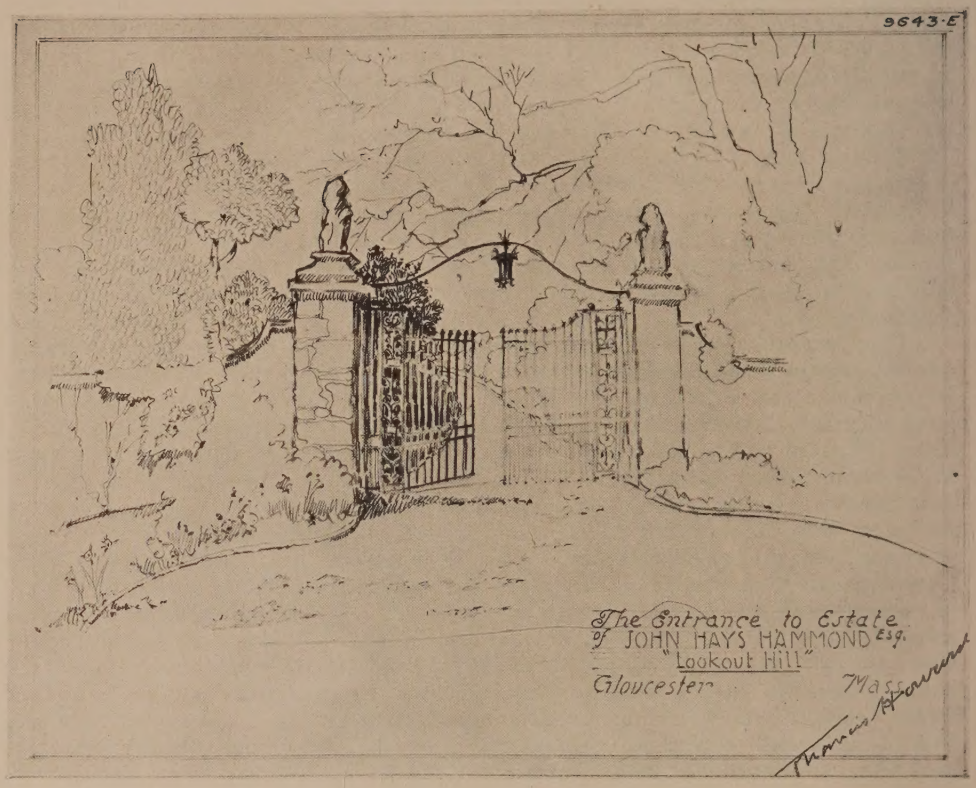
To the second type of client who believes that an architect's services are expensive and unnecessary, I suggest that he may be interested in saving money and at the same time getting a better job. Of course, this gains his attention. Taking as an example a specific case of a house I built last year for Mr. B. in Maplewood, N. J., I gave him two sets of estimates; the one being the set as obtained by me through the various contractors and the other as given by a general contractor. They were as follows: Architect's figures: Total for the various bids, $32,067; the figure as handed in by the general contractor, $35,490; or a difference of $3,423. My fees on this job figured $1,924, still being a saving of $1,499, or a little more than 4½ per cent on the total cost of the house as represented by my figure. I emphasize to my client that besides saving money he gets the benefit of an architect's services. Of course, these figures vary according to the size of the job. The reason for the big difference between the general contractor's bid and the one as submitted by the architect is accounted for by the fact that the general contractor is usually either a mason or carpenter subletting four out of the five bids and each time adding his 10 per cent profit to each bid; whereas the architect, by getting in individual bids, takes the place of the general contractor and charges but 6 per cent for his fees. This argument has always been convincing, and in closing I would lay stress upon the fact that the architect can guarantee his client a saving of at least his own fees when figuring against a general contractor.

Very truly yours,

W. W. KLENKE, *Architect.*

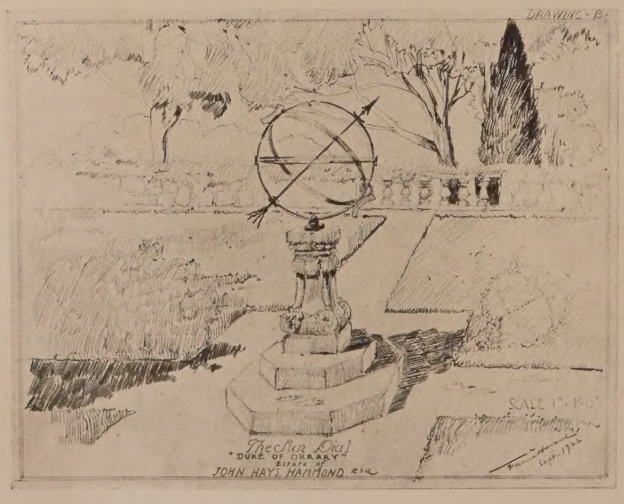
A Tudor Garden in New England

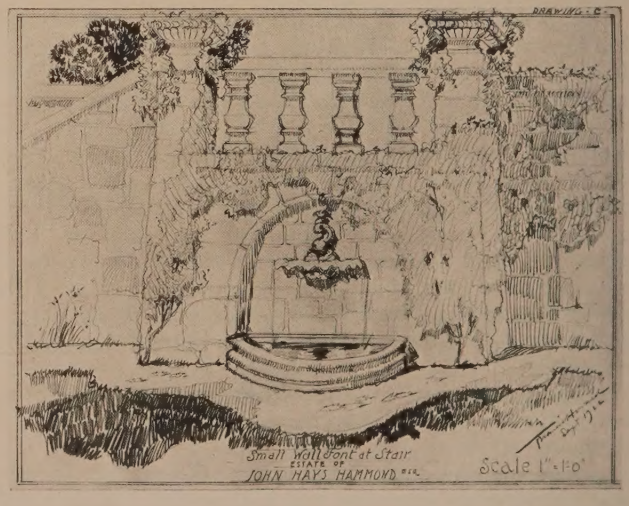
Francis Howard
Garden Architect



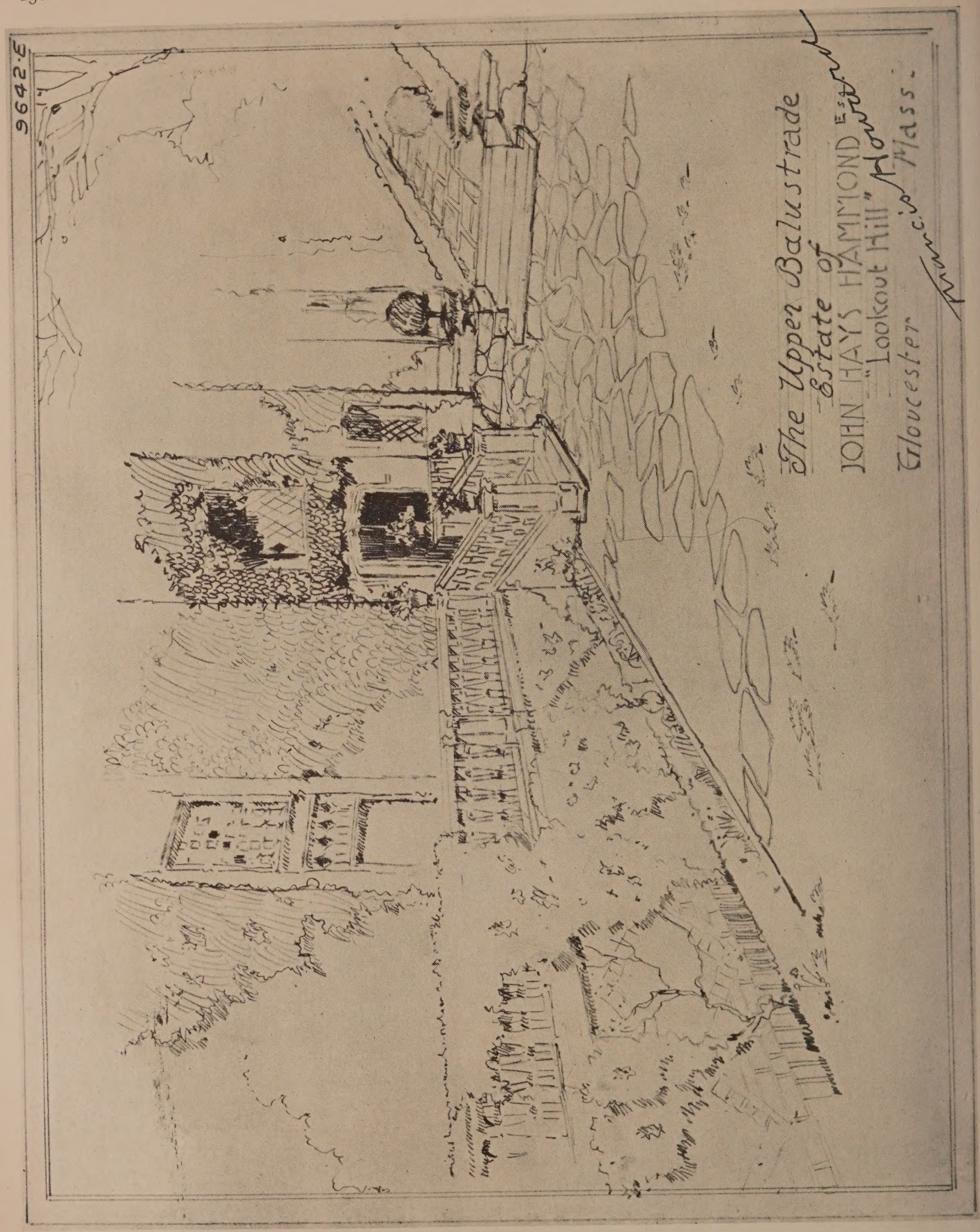
THE problem of making a sympathetic and dignified setting for a modern residence of large size, designed in the style of the Tudors, was the difficulty to be solved in the case of the country home of Mr. John Hays Hammond, at Gloucester, Mass. The house was enlarged and rebuilt from the family's old home, and its character so changed that the woodland, rocks, and sea surrounding it bore a different relation to the new structure than they did to the old, which latter was a rather ordinary building, dating from about 1875. Mr. Howard's suggestion, which has been adopted by the owner, was to place the new building upon a noble terrace of stone, two hundred feet long and sixty-five feet wide, on which forest trees, seventy-five feet high, are left growing undisturbed. This terrace faces the sea and, looking toward the east, the cliffs and beautiful shores of Gloucester Harbor recede from view and make fascinating vistas. Immediately next the house and going around at the south end, is an upper tiled terrace surrounded by a low balustrade of graceful proportions. There are two flights of brick steps going down from this level to the main terrace below. At the northern end of the house the main line of the façade is carried along by a brick retaining wall, supporting another terraced garden, which is called the "Terrace of the Flowers." This latter is planted with brilliant flowering plants in beds surrounded by evergreen hedges in the old English manner, so that looking out from the library, which is at this end of the house, one is surrounded by flowers. This northern division of the garden swings out in a semicircle in front of the principal north gable of the design, and in the middle of the semicircle is a ten-foot fountain pool, containing an artistic ornament of bronze, which throws a jet of water among the flowers.

All the work has been carried out under the personal supervision of Mr. Howard, assisted by Mr. A. A. Shurtleff, of Boston, and the results already achieved promise one of the most interesting gardens of this type that have yet been undertaken in America.






3641-E
The Wild Garden & Cliff Walk
Estate of
JOHN HAYS HAMMOND Esq
"Lookout Hill"
Gloucester
Mass.


9642.E
The Upper Balustrade
Estate of
JOHN HAYS HAMMOND Esq.
Lookout Hill, Manchester
Gloucester Mass.

ARCHITECTVRE*
Published by Charles Scribner's Sons
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
*Reg. U. S. Pat. Office

Editorial and Other Comment

President Gilbert

IT has been announced that Mr. Edwin Howland Blashfield has declined a renomination for the presidency of the National Academy of Design, and that his probable successor will be Mr. Cass Gilbert.

Mr. Blashfield has been an inspiring leader of the academy, and his work in behalf of American art has been constant and always with a wide tolerance for the younger men with new ideas.

Kindliness and encouragement for others, and an unfailing belief in the art of his own country have endeared Mr. Blashfield to all who have had the good fortune to know him. In his own work as dean of our mural painters he has won high distinction.

Mr. Gilbert's standing in his own profession of architecture needs no comment, and that he is more than ordinarily skilled in the use of the brush has been revealed recently in an exhibition of his water-colors. It seems to us a most happy thought on the part of the academy to nominate Mr. Gilbert as its leader.

His interest in all the arts is in keeping with that of Mr. Blashfield, and he will bring to his task the enthusiasm and vitality that the academy needs if it is to carry out some of its cherished plans.

Be Sure of Your Architect

WE have received from the Bureau of Architecture of the Methodist Episcopal Church, Elbert M. Conover, director (1701 Arch Street, Philadelphia), a circular entitled "The Employment of an Architect (A Serious Matter)." It is a serious matter, involving not only the question of good design, but especially the ever pressing problem of economic yet sound construction.

This circular is being sent to all the district superintendents, bishops, and official publications of the Methodist Episcopal Church, and it should do much to assure better architecture and relief from many of the perplexing and expensive mistakes resulting from the employment of incompetent practitioners. "An architect should be employed on the basis of his ability to solve a building problem, and not on his ability to sell his services or to make a pleasing impression upon the building committee. Do not be surprised if the most capable architects do not solicit work."

The functions of the architect are too little understood by the general public, and in many rural communities the name is suggestive only of the carpenter and builder. There are always certain members of committees who are apt to think of the employment of an architect as something of a luxury, a needless and extraordinary expense.

This circular will clarify the atmosphere for many communities thinking of building the new church this summer. It might prove a serviceable document to have in your files.

"Certain calamitous results on account of inefficient architectural service recently observed have stimulated this communication.

"Poor architectural service results in a waste of space and material, and ugly, inadequate and unsafe buildings.

"The architectural profession is one of the learned professions in which the members, if competent, must have the technical skill and knowledge required by their work, business and executive ability and to all this the addition of artistic feeling with a background of general scholarship. The trained architect has taken courses in liberal arts, literature, and history as well as technical training in design, architecture, and engineering.

"The 'plan drawer' in States that have lax laws regarding registration of architects may be merely a draftsman or builder, who can represent in a bare way the elements of construction, leaving all important details to be filled in as may suit the whim of any one into whose hands the 'plans' may fall.

"In many States the law governing the practice of architecture is very explicit, fixing definite responsibilities upon the architect. In States requiring the registration of architects after having passed a State examination, it is illegal to use the term 'architect' without such legal registration."

On other pages of the number appears a letter from an architect who has been doing missionary work in his local community in the way of showing that the architect is not a liability but an asset, a saver of both money and care. In the small-house field especially we need a lot of enlightening work of this kind.

Frenzied Publicity

NOTHING gives us more pleasure than to chronicle the prosperity of the building trades, the uprearing of thousands of structures all over the country, the activity in the offices of the architects who design them. The figures involved are astounding enough translated into dollars and cents, and the "boom" seems a wholesome and continuous one. Many great buildings go up, large suburban developments are completed, and we hear of them chiefly through the real estate columns of our newspapers. In only a few instances are we inflicted with daily communications, sales literature, written in terms that on the surface make us take up a handful of salt with which to sprinkle the type before reading. It can't all be true, and in the very tenseness of the publicity we suspect some crying need.

Ballyhoo methods may work on the spot where the migrant populace is hunting the illusive dollar, that may or may not be made overnight, where fortunes have been made, and lost, be it said, in the atmosphere of frenzied bargaining in land and building.

Out of it all has come some architecture of more than passing interest, suitable for its environment, and with a

certain Old World picturesqueness. When the shouting is over one may take the time to separate the good from the bad, and perhaps extend congratulations to the architects who have kept their heads and not been led into exaggerations that they will live to regret.

We are said to be a "temperamental people." It isn't temperament that has led thousands to the land of the late Ponce de Leon, but the fascinating prospect of finding dollars almost for the asking. Not the Fountain of Youth, but the solace of old age, money in the bank, or the price of a refuge from the rigors of our northern winters, have been the lures that have filled the land with fairy tales. We may be temperamental; we are certainly good flockers, ready listeners to specious and misleading bunk.

We are sure there are a lot of good people living in Florida who wish that they might be left to enjoy their homes without the feeling that they ought to sell out, and that they may continue to be sure of the character of their neighbors.

Visionaries

WE dare say that all architects worthy of the name are visionaries. Unless they dream and imagine quite a bit they are apt to get into an academic rut, and play around in it all their lives.

Any one who has even half an eye for the wonderful things of our time can hardly be surprised or entirely sceptical of the towers "a quarter of a mile high," or towers of glass, that Raymond M. Hood and William O. Ludlow write about. Mr. Hood, writing in a recent number of the magazine *Liberty*, says New York's skyline will climb much higher, and that the time will come when there will no longer be any homes on Manhattan Island, the entire space will be taken up by business buildings. The bridges of the future will be made into apartment-houses for the very rich.

Nothing seems any longer impossible. The will to do and the money to pay for the thing willed and, presto, it is done.

MR. HOOD'S ONE HUNDRED FLOORS OF TOWER

I have before me a drawing of a building that has not been erected. It may never be erected—yet it suggests a possible solution. It would be a tower a quarter of a mile high, one hundred and fifty feet square, its base on the ground.

One hundred floors of tower as bold as the Washington Monument and as sheer. Its batteries of elevators would be in the centre and would run like railway trains, one after another in each shaft, expresses stopping every tenth floor or so.

This building is no mere dream. True, it hasn't been built. The working plans haven't been drawn. But the building is coming whether I am its author, or some one else. Safe? As safe as your present building of twenty and forty and more floors. To be sure, it will sway and bend in obedience to winds and temperature, and the summer's sun. It would be unsafe if it didn't.

Too great a strain upon the foundations? Nonsense. Consider this: The modern office building twenty stories high places less strain upon the stony substructure of Manhattan Island than no building at all. Why? Because your building weighs less than the earth and rock excavated for its foundations.

Mr. Ludlow, in an interview in the New York *Times*, talked about the possibilities of glass as the covering of the steel frames of our tall buildings. We may have great towers of crystal gleaming in the bright sunshine of our recently smoke-cleared town.

There is the æsthetic opportunity offered by building with glass. Here a new world opens up to us. There is no doubt in my mind that when we have properly solved the designer's problem of fusing glass walls with steel construction, we shall be able to build structures of the utmost beauty. A thing is beautiful often if it is simply logical. The first step is fully to accept the new building logic that follows from the employment of steel. We must accept the steel skeleton, without masks of any kind. Hitherto we have used small units of brick or terra-cotta to cover up the framework and make it look solid; but these small units or opaque curtain walls are only a convention, a hangover from the days when the walls supported the weight of the building.

With the coming of the glass building the steel framework will be completely expressed in the exterior design.

The Tragic Death of Professor Hamlin

STRUCK by an automobile as he was crossing Riverside Drive at 117th Street, New York City, near his home, on the evening of March 21, Doctor Alfred Dwight Foster Hamlin, professor of the history of architecture at Columbia University, died soon afterward at Saint Luke's Hospital.

Doctor Hamlin had been professor of the history of architecture at Columbia University since 1904. He was born in Constantinople and was in his seventy-first year. His father, the Reverend Cyrus Hamlin, was president of Robert College at Constantinople.

His first assignment with the Columbia University faculty was in 1885 as a special assistant. From 1887 to 1889 he was an instructor. He became assistant professor of architecture in 1889, adjunct professor in 1891, and professor in 1904. He was educated at Amherst, the Massachusetts Institute of Technology, and the Ecole des Beaux-Arts in Paris.

Professor Hamlin was a frequent contributor to architectural publications, encyclopædias, and dictionaries, and was the author of "A History of Architecture," a standard text-book on the subject; "European and Japanese Gardens," "History of Ornament, Ancient and Mediæval," and "History of Ornament, Renaissance and Modern." He belonged to the American Institute of Architects, Archæological Institute of America, and Société Archéologique de France.

Both in America and abroad, Doctor Hamlin was considered an authority on architecture, city planning, and Near East affairs.

Doctor Hamlin is survived by his wife and four children: Doctor Marston Hamlin, a research chemist, of Canajoharie, N. Y.; Talbot F. Hamlin, of the architectural firm of McGill & Hamlin, 415 Lexington Avenue, author of a delightful book on "The Enjoyment of Architecture"; Mrs. Leonard C. Todd, of Worcester, Mass., and Miss Genevieve Hamlin, of 39 Claremont Avenue, New York City.

Winners in the Competition for a Design for an Historical Device for the Octagon House, Washington, D. C.

THE jury who judged the designs submitted in this competition have made their findings as follows:

First Prize, $150: August Reuling, 101 Park Avenue, New York, N. Y.

Second Prize, $100: Harold A. Rich, 23 Newell Road, Auburndale, 66, Mass.

Third Prize, $50: J. T. Jacobsen, 3815 Spruce Street, Philadelphia, Pa.

First Mention: Ernst C. Bachschmid, 2536 Hall Place, N. W., Washington, D. C.

Second Mention: W. Strudwick Arrasmith, A. I. A., 413 Norton Bldg., Louisville, Ky.

I wish to express the thanks of the Building Committee to the thirty-one designers who submitted drawings in this competition. It is pleasant to note that you are located in various parts of the country, from Massachusetts to California, and from British Columbia to Florida.

Any competitor who cares to have his design returned will kindly notify me.

D. Everett Waid,
President.

Y. W. C. A. BUILDING, PLAINFIELD, N. J.

F. B. and A. Ware, Architects.

CORNER OF LOBBY.

LOUNGE.

AUDITORIUM.

GIRLS' CLUB ROOM.

F. B. and A. Ware, Architects.

Y. W. C. A. BUILDING, PLAINFIELD, N. J.

ENTRANCE-HALL.

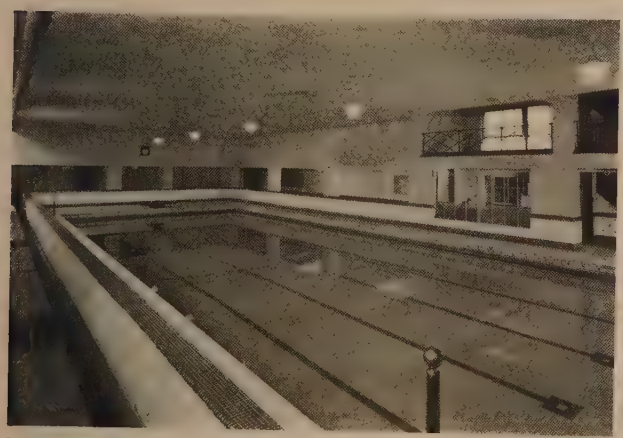
Y. W. C. A. BUILDING, GALVESTON, TEXAS.

F. B. & A. Ware, Architects.

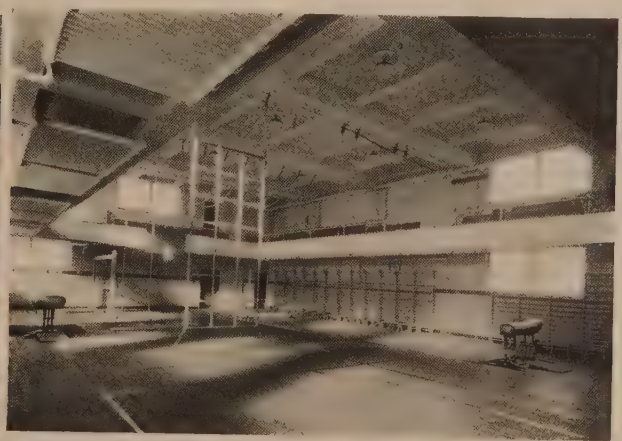
Y. M. C. A. BUILDING, SAN ANTONIO, TEXAS.

Adams & Adams, Architects.

BOARDING RESIDENCE.



SWIMMING-POOL, ACTIVITIES BUILDING.

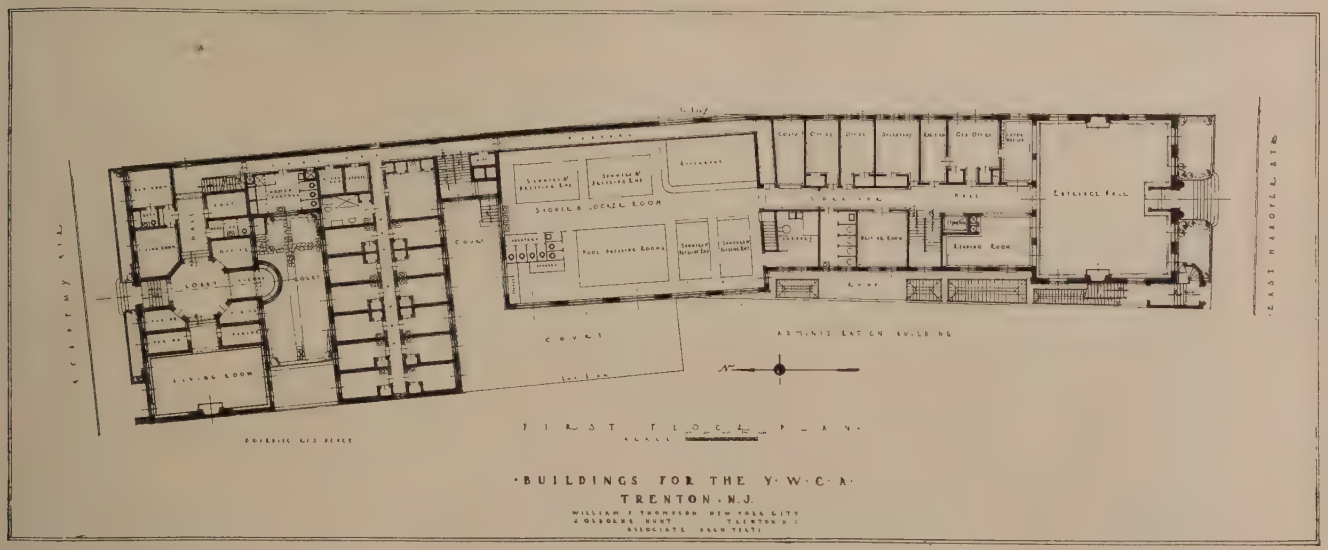


GYMNASIUM, ACTIVITIES BUILDING.

Y. W. C. A. BUILDING, TRENTON, N. J.

W. F. Thompson, Architect; J. Osborn Hunt, Associate Architect.

ACTIVITIES BUILDING.



FIRST FLOOR PLAN.

Y. W. C. A. BUILDING, TRENTON, N. J.

Wm. F. Thompson, J. Osborn Hunt, Associate Architects.

LIVING-ROOM, BOARDING RESIDENCE.

SOCIAL HALL, ACTIVITIES BUILDING.

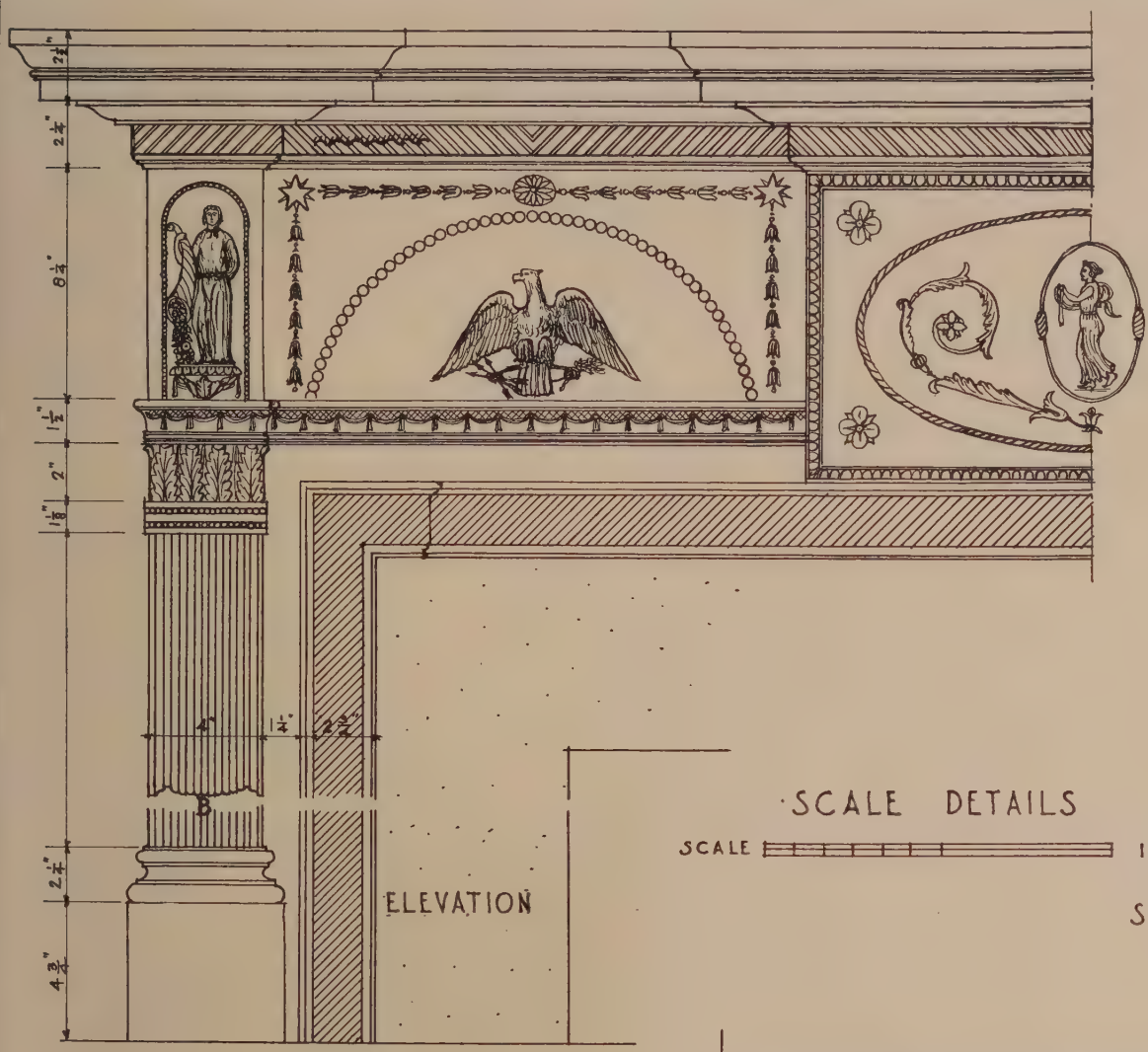
W. F. Thompson, Architect; J. Osborn Hunt, Associate.

Y. W. C. A. BUILDING, TRENTON, N. J.

LOUNGE.

DINING–ROOM.

Y. W. C. A. BUILDING, NEW BEDFORD, MASS.
W. F. Thompson, Architect; Edgar B. Hammond, Associate Architect.



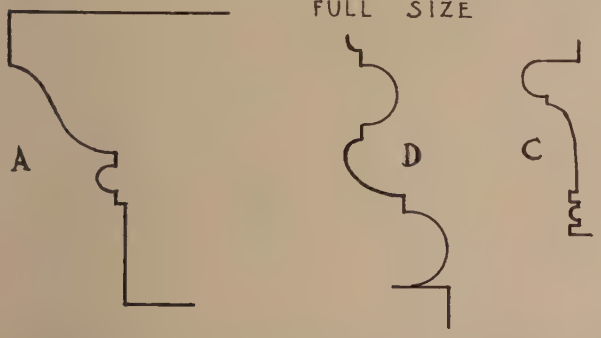
SCALE DETAILS

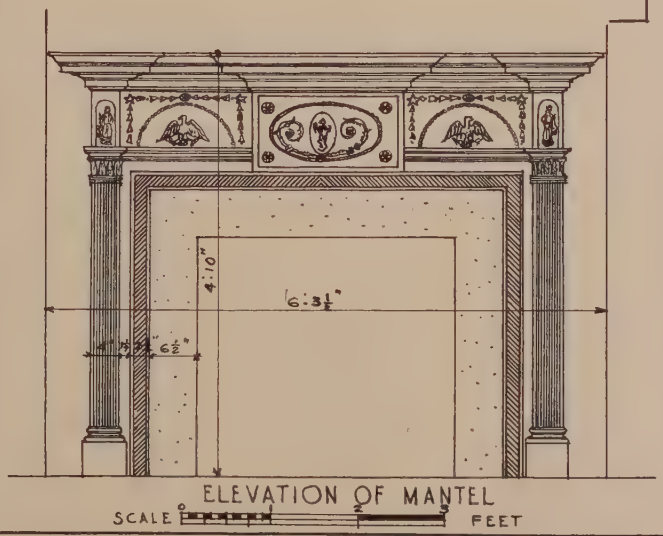
SCALE INCHES

DETAILS OF MOULDINGS

B

FULL SIZE





ELEVATION OF MANTEL

SCALE 0 1 2 3 FEET

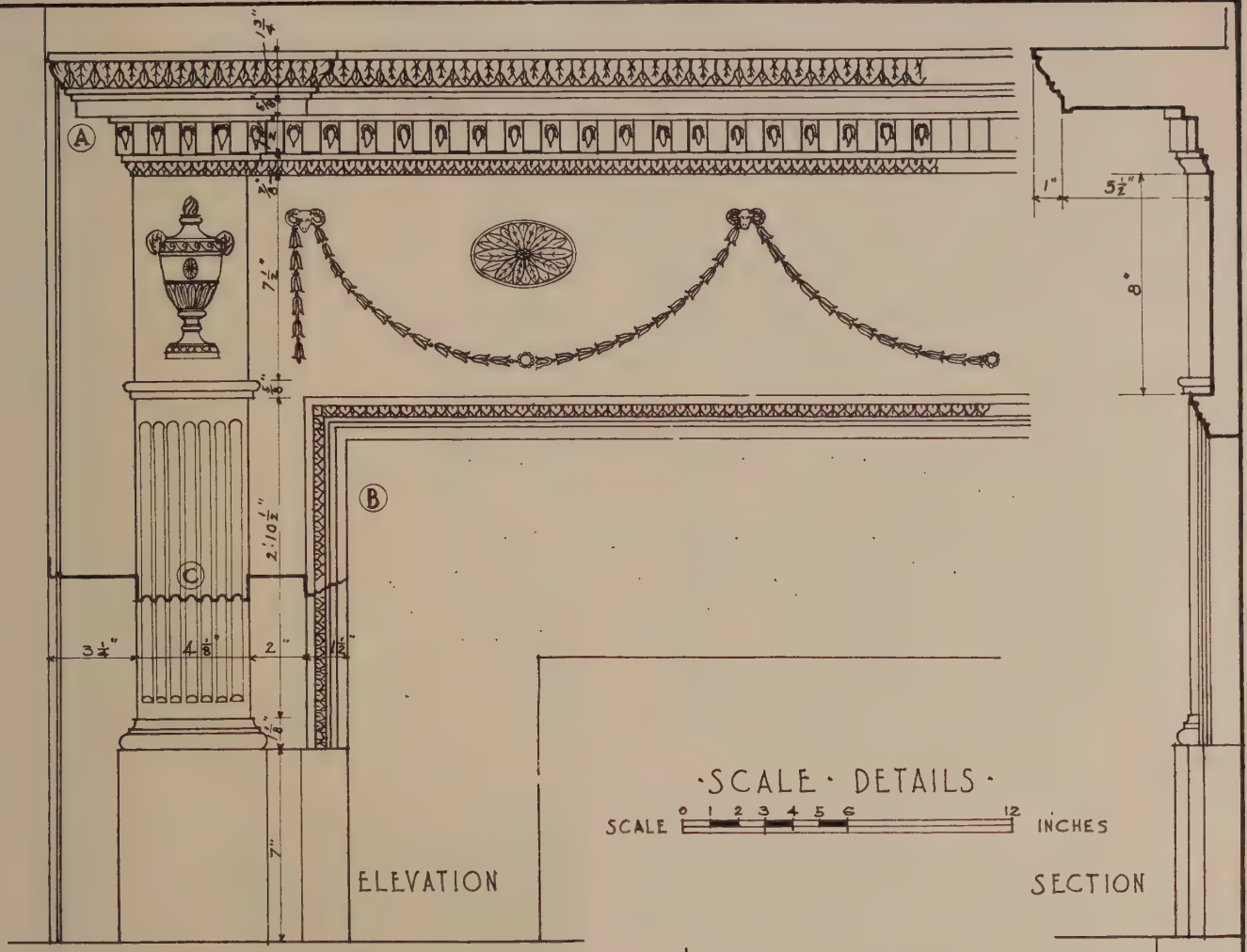
COLONIAL ARCHITECTURE OF THE DISTRICT of COLUMBIA

MANTEL IN HOUSE

2029 · E · ST. N.W. WASHINGTON, D.C.

CIRCA 1800

MEASURED AND DRAWN BY ALBERT P. ERB 1923



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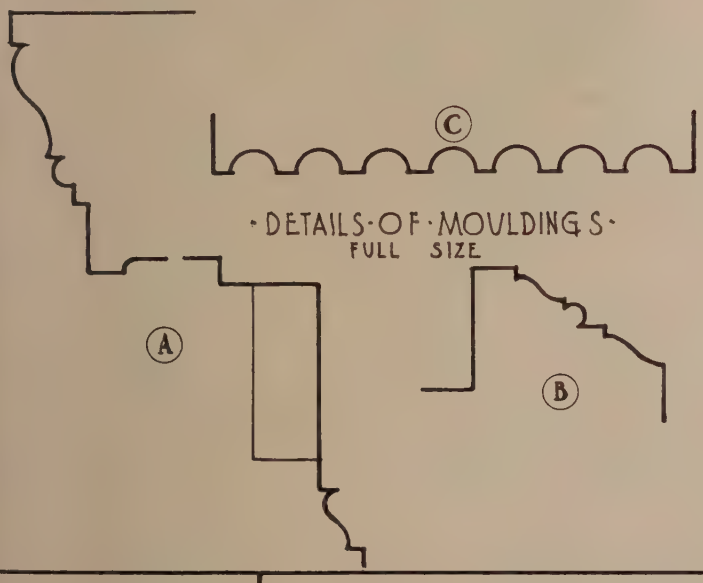

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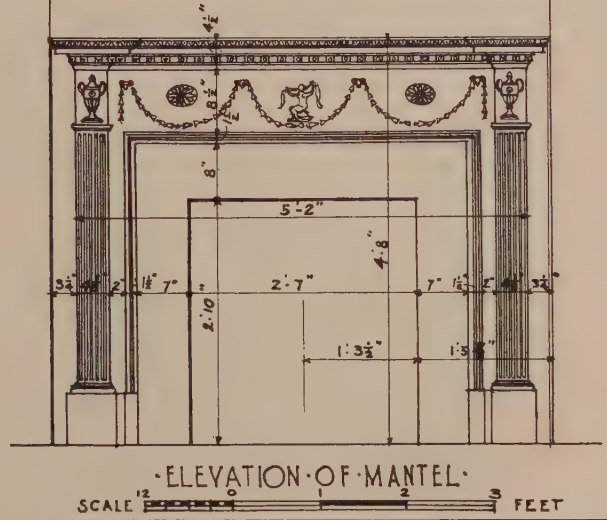

·ELEVATION·OF·MANTEL·

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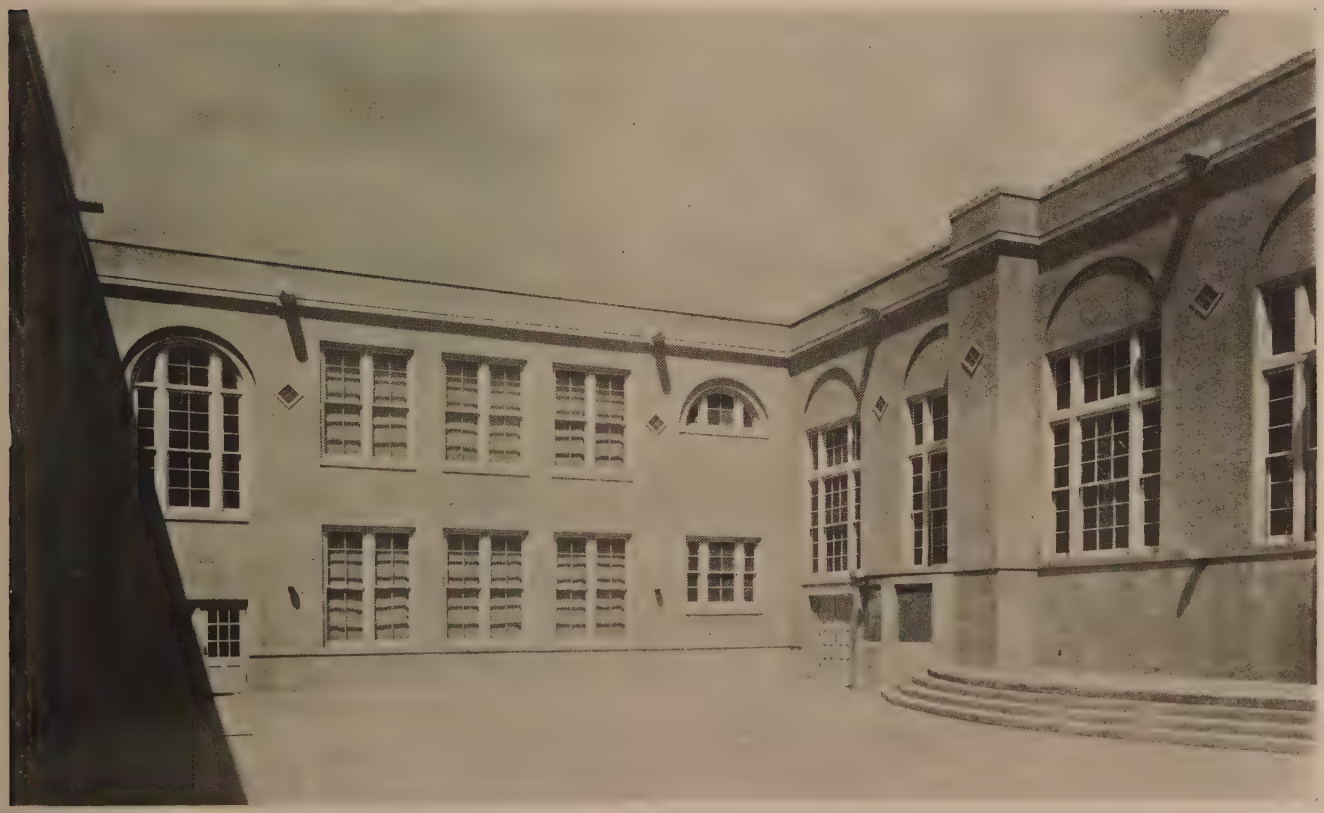
·COLONIAL· ·ARCHITECTURE· ·OF THE· DISTRICT of COLUMBIA	MANTEL IN HOUSE ·2029 · E· ST. N.W. WASHINGTON, D.C. ·CIRCA·1800·	·MEASURED AND DRAWN BY · ALBERT P. ERB · 1923

SOUTH JUNIOR HIGH SCHOOL, COLORADO SPRINGS, COLO.

Late firm MacLaren & Hetherington, Architects; W. B. Ittner, Consultant. Designed by T. MacLaren.

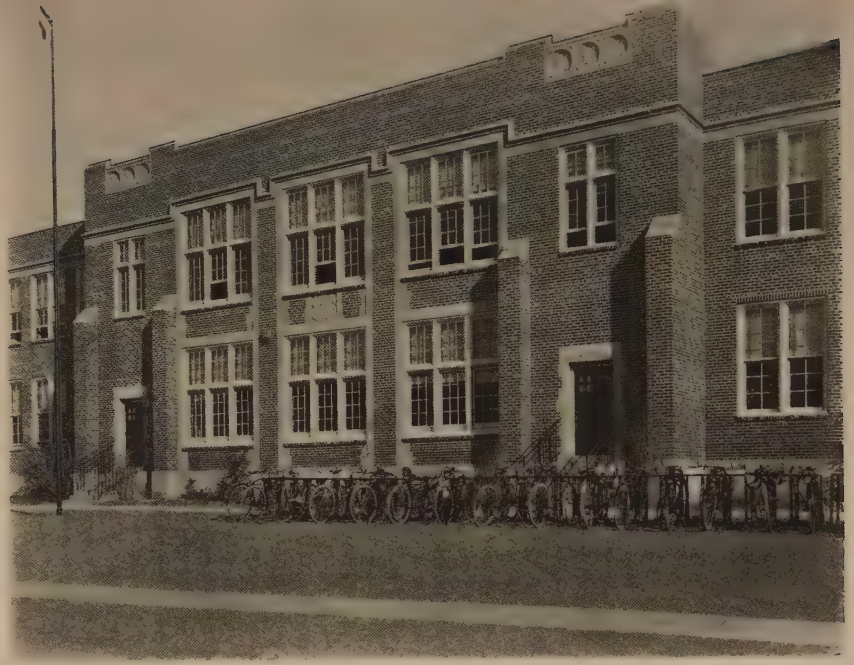
WEST JUNIOR HIGH SCHOOL.

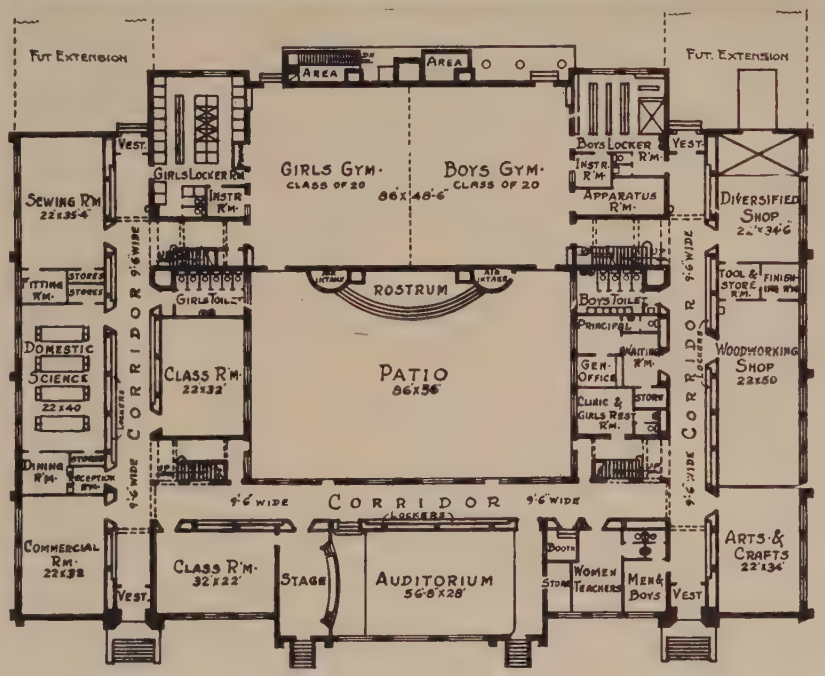


PATIO IN SOUTH AND WEST JUNIOR HIGH SCHOOLS.

JUNIOR HIGH SCHOOLS, COLORADO SPRINGS, COLO.

Late firm MacLaren & Hetherington, Architects: W. B. Ittner, Consultant. Designed by T. MacLaren.





FIRST FLOOR PLAN
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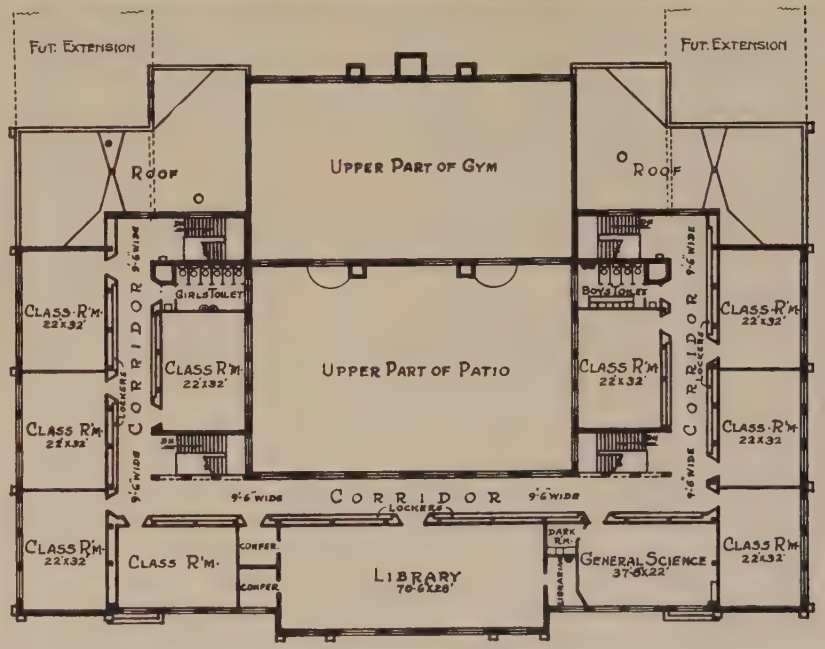


SECOND FLOOR PLAN
SCALE 1/32 INCH-1 FOOT

SOUTH AND WEST JUNIOR HIGH SCHOOLS, COLORADO SPRINGS, COLO.

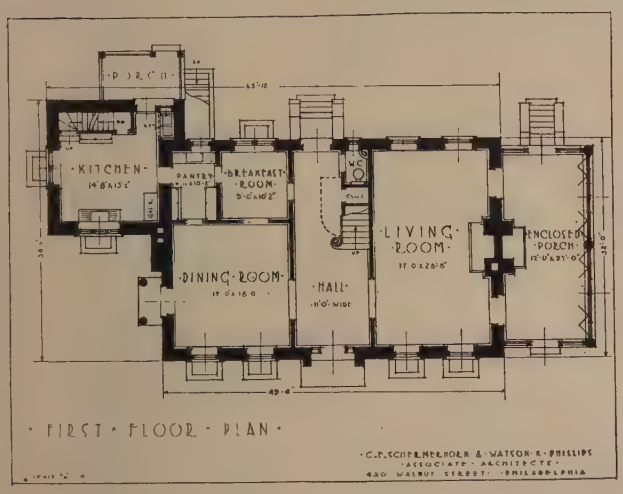
Late firm MacLaren & Hetherington, Architects; W. B. Ittner, Consultant. Designed by T. MacLaren.

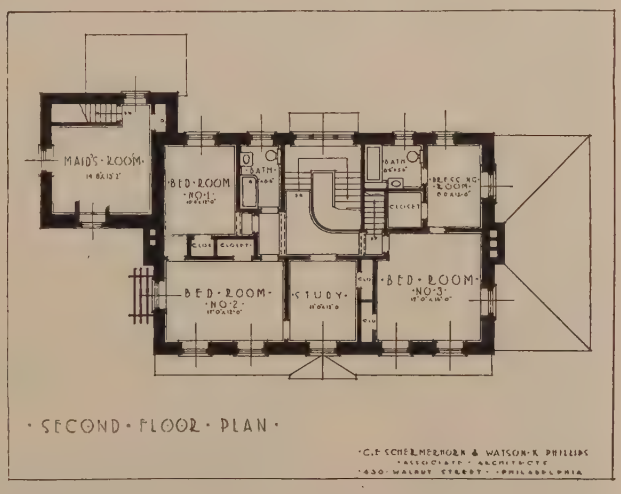
DETAIL OF DOORWAY, SOUTH JUNIOR HIGH SCHOOL.

DETAIL OF DOORWAY, WEST JUNIOR HIGH SCHOOL.

SOUTH AND WEST JUNIOR HIGH SCHOOLS, COLORADO SPRINGS, COLO.

Late firm MacLaren & Hetherington, Architects; W. B. Ittner, Consultant. Designed by T. MacLaren.





THE HEISS RESIDENCE, AMBLER, PA.

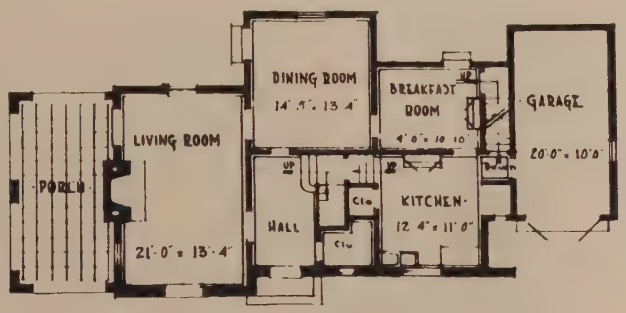
C. E. Schermerhorn and Watson K. Phillips, Associate Architects.

DETAIL.

DETAIL.

C. E. Schermerhorn and Watson K. Phillips, Associate Architects.

THE HEISS RESIDENCE, AMBLER, PA.



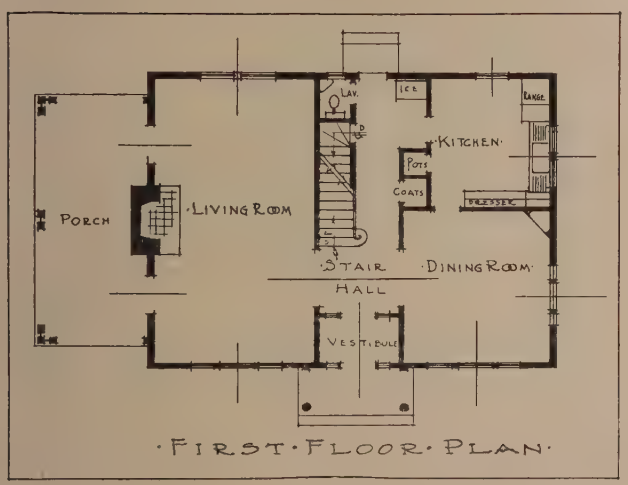
RESIDENCE, GORDON B. ANDERSON, DREXEL PARK, PA. Wallace & Warner, Architects.

DETAIL.

DETAIL.

Wallace & Warner, Architects.

RESIDENCE, GORDON B. ANDERSON, DREXEL PARK, PA.



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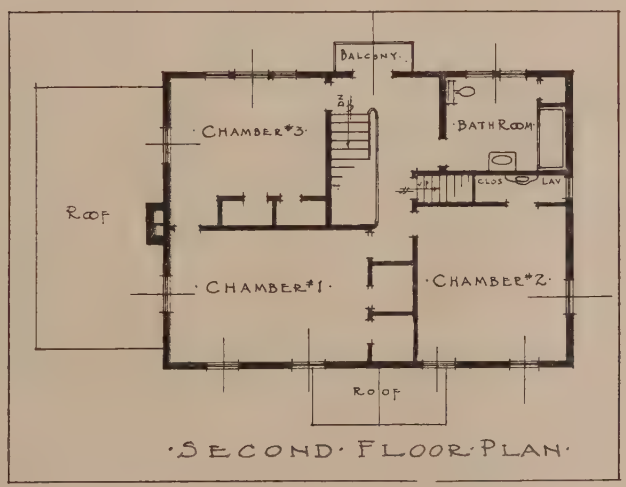
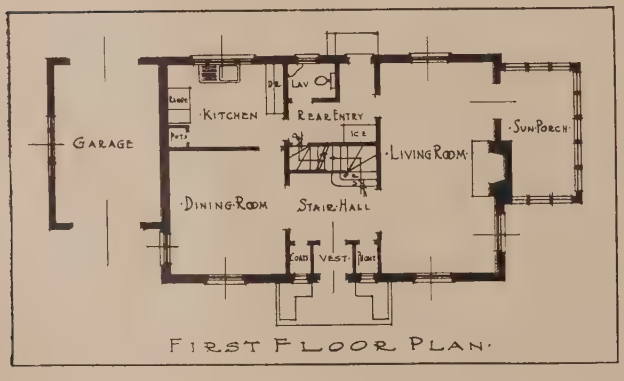


SECOND FLOOR PLAN

RESIDENCE, CHARLES F. MOORE, MAPLEWOOD, N. J.

William W. Klenke, Architect.



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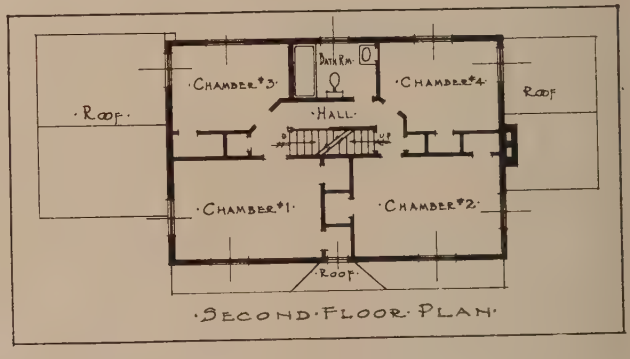


SECOND FLOOR PLAN.

RESIDENCE, HARGRAVES W. MURRAY, MAPLEWOOD, N. J.

William W. Klenke, Architect.

MASTER'S HOUSE.

SCHOOL BUILDINGS, BOGOTA, COLOMBIA.

Robert M. Farrington, Architect.

La Granja "El Henar"

A Café in Madrid

By Arniches & Dominguez, Architects

THE design submitted by MM. Dominguez & Arniches was placed first in the competition held for the decoration and furniture for the new café La Granja "El Henar."

Lighting-fixture of silvered tin.

The structure, of steel columns and beams, was not to be touched. As the plans show, these columns were very irregularly placed; the sizes of the steel beams differed very widely, too; so the architects decided to make this irregularity contribute the effect and atmosphere rather than to try to conceal it by a more "formal" design. They tried to fulfil the essential need for comfort that a modern café requires within the spirit of a true Madrid atmosphere. They have tried to simplify, to modernize the typical buildings of old Madrid of the seventeenth and eighteenth centuries without losing any character and expression.

It has been a principle with their work that each material should be treated with its characteristic form and to get the decorative effects more by the variety of good materials adequately treated in form and quality than through the elaboration and profuseness of detail.

The Café Room.—It recalls the old baroque city halls of Madrid. The floor is of big slabs of white stone relieved by smaller squares of black slate. The seats alongside the walls are covered with leather. The oak panelling is of typical design and the proportion is tinted gray. The walls are covered with a stucco of lime and marble sand, of a lively texture. The light-fixtures, of wood and silver plate, with crystal candles of large proportion, give the whole room a greatly expressive appearance. There are oak beams on brackets in the ceiling.

The only elaborated detail is the entrance doorway of the purest Spanish neoclassical design.

The Patio.—This has been formed at the back of the café room and occupies both ground and mezzanine floors. This patio is a modern reminder of the old Madrileñean inns where country carts used to stop when they came to town. These old inns of Madrid have a character all of their own, and this patio is not a Spanish patio, not even a Castilian patio; it is a patio of Madrid.

Detail.

The floor is tiled, with lines of stone slabs enclosing the tiled portions; seats are covered with cloth of characteristic design and color; there is a tiled frieze with a variety of warm, rosy, golden, and brown colors obtained by the fire itself and popular designs on some of the tiles: old playing-cards; Madrid's popular fountains and gardens, etc. The stucco is of lime and river sand. The armchairs have straw seats. The light-fixtures are of various types: on wall niches big wrought-copper bowls reflect the light of iron "candiles." On wooden brackets in the patio's well are big glass lamps of peculiar proportion. The structural wood is of pine, painted light cadmium, and the moulding and profiles of the eaves are characteristic of Madrid. The iron balconies are very simple and have only one wrought-iron baluster in the centre.

Street front. Gray polished granite and oak. Brass lamps.

The Tea Room.—Is on the mezzanine floor, over the café room. The furniture is finer, daintier than that of the patio and café rooms. The whole breathes the romantic atmosphere of the middle nineteenth century.

CHIMNEY IN TEA-ROOM.

CAFÉ ROOM.

PATIO STAIRWAY.

PATIO FROM GALLERY ABOVE.

A CAFÉ IN MADRID.

Arniches & Dominguez, Architects.

MAIN ROOM.

PATIO, LOWER GALLERY.

TEA-ROOM. SOFT TONES OF WHITE, GRAY, AND SILVER.

PATIO, UPPER GALLERY.

A CAFÉ IN MADRID.

Arniches & Dominguez, Architects.

Fundamentals of Service Planning for Architects

An Analysis of Promotion Factors Determining Economical and Efficient Building Management

By Jas. M. Green, Jr.

ARTICLE II

Investment

THE problems of the merchant and the building owner, while fundamentally the same, diverge. In extensions or the inauguration of new projects, both must possess the capacity to appraise the value of competitive institutions as well as keep informed upon their own current value as a going concern. When the merchant invests he anticipates reinvestment in larger stocks, while the building owner usually makes his entire capital outlay at once. The merchant's worth lies chiefly in stocks and turnover, while the building owner's value is tied up in unearned increment and larger profit looms hopeful only through slowly increased revenue by lease renewals at higher rates. The merchant works in a fluctuating market while the building is not so susceptible to immediate changes. The profits of a building owner are stabilized and distributed over a long term because of necessary amortization and protective sinking funds accumulated to offset obsolescence and depreciation. Unlike the merchant the building owner must face the end of economic life, whether or not he be prepared. It is a knowledge of the day-to-day details acquired through management channels that regulates with safety the proper distribution of capital and profits.

It is the sixth sense of *Appraisal*—an attribute of the well-informed architect and building manager—so keenly first functioning during the period of promotion, that continuously acts to safeguard the investment the building executive manages. Perhaps neither the architect nor the building manager can qualify as appraisal specialists, but inherent capability, allied with sound judgment and actual realty experience, furnishes the essentials for reasonable estimating. Some of the principles underlying this inexact science and upon which logical appraisal is founded, are:

1. Personal qualifications of the appraiser:
   - Honesty and integrity.
   - Disinterestedness.
   - Experience translated into judgment.
2. Location and accessibility of the property.
3. Physical characteristics.
4. Values and development:
   - These are "all those elements in the wealth of a nation which are supposed to be furnished by nature, as distinct from those improvements which owe their value to the labor and organizing power of man."
5. Neighborhood character:
   - Development of the district.
   - Enhancement or value declination.
   - Effect on tenancy.
   - Effect on the investment.
6. Density of population:
   - Buying power.
   - Passage of people.
7. District shifting.
8. Salability.
9. Forced sale considerations.
10. Structural factors:
    - Depreciation.
    - Obsolescence.
    - Multiple tenancy: use by a number of utilities so that one competes with the other, thus insuring development to the highest utilization.
    - The tenants:
      - Character.
      - Rating.
    - Long leases.
    - Convertibility.
11. Analysis of sales and rentals of similar property.
12. Income and disbursements.
13. Transportation facilities.
14. Definite estate or interest.
15. Industrial considerations:
    - Cost.
    - Railway service.
    - Switching facilities.
    - Source of raw materials.
    - Distribution of product.
    - Access:
      - Pedestrians.
      - Vehicles.
    - Labor supply:
      - Characteristics.
      - Transportation.
      - Housing.
      - Social and economic.
16. Acreage values:
    - Topography.
    - Trees.
    - Physical conditions.
    - Location.
    - Environment.
    - Improvement possibilities:
      - Sewerage.
      - Lights.
      - Water.
      - Gas.
      - Streets.
    - Estimated cost of development.
    - Carrying charges.
    - Potential profit.

The subject of *Depreciation* is obviously important to the architect and the building manager. Says the United States Chamber of Commerce: "Depreciation attempts to measure the effects of time and production on physical properties and equipment and to record the results in dollars and cents. This computation cannot be exact because the elements effecting depreciation are many, and their relative importance difficult to determine. The use and character of property, its maintenance, the quality of installation, and often local conditions, variously modify the life of the property, while an unexpected industrial advance may suddenly terminate the usefulness of the property, and completely upset depreciation calculations. One fact concerning depreciation is certain: it can be postponed but not ultimately avoided. All your plant and equipment suffer from and finally succumb to depreciation. The business man who does not charge depreciation at all is fooling himself. He is making no provision for the inevitable day when his property must be scrapped. His supposed profits may in fact be a distribution of his capital."

Insurance is a highly protective mechanism to the owner's investment. The technicalities of the insurance contract and the forms of coverage are things which the architect and building manager must understand in a general way, but it is to the modern brokerage office and their mechanical and casualty engineers that they should turn for specialized knowledge in the reduction of hazards, stipulations of insurable interest, additional insurance, alterations, and repairs, night work, occupancy and unoccupancy, and various other determinable features which affect and limit the proper insurance contract. Well-considered preliminary analysis makes for reductions in construction cost and future charges. The usual insurance contracts cover:

- Loss or damage by fire.
- Plate glass.

Workmen's compensation.
Bad debt or credit.
Leasehold interest: Protects many phases of investment which may be endangered by operation of the fire clause in the lease.
Lifts and cranes.
Mortgage.
Sprinkler leakage.
Steam-boiler.
Fly-wheel.
Electrical breakdown.
Title.
Rental: Generally carried to protect losses against the moving out of tenants or loss of rent because of untenantable property resulting from fire.
Earthquake or tornado.
Consequential damage: Protects replacement after fire in compliance with municipal regulations, whether or not the requirement is a repair job or new installation.
General liability and elevator insurance.
Riot, strike, and explosive.

A great deal has been said by a number of persons regarding rental values of space, but here will only be briefly considered retail store space. The subject of retail store space presents to the architect and building manager fascinating prospects; it looks far beyond the lease and determines success of management in direct ratio to public approval. The signing of a lease does not warrant indifferent management, for accelerated duties are added which may be thus classified:

Care:
Maintenance of prestige as acceptable shopping unit.
Under lease control:
Store windows.
Repairs.
Lighting.
Interior sanitation.
Cleanliness.
Attractiveness.

Management:
This is intimately associated with rental considerations. The difference between the management of store and office space is merely a matter of detail. The same diplomatic interpretation of tenant requirements; the recognition of interdependent relations between tenant and manager; the same skill in the adjustment of space and conditions; it is *management* which forces few properties high above the minimum, and develops them into real income producers.

Rental Values:
Either retail store or office space has a standard rental value based primarily upon the cost to construct and maintain. The standard should place the income for the average well-located, utilitarian and properly managed structure above the minimum. If it does not, then unit rentals should immediately put it there.
Generally speaking, floor rentals average twice the returns for office space.
Store rentals should equal the ground rent or twice the taxes on the land. The rental for store space also bears an apparent relation to the passing traffic. In like manner the value of the land itself is affected by the traffic.

Operation

In the field of *special services* the building manager has unlimited possibilities which may be turned into substantial profit. It is the unexpected thought which creates a greater *esprit de corps* among managers and tenants, and the ensuing good-will has definite financial rating. There is no strict line of demarcation between general and special service. An owner may add lighting to the rent bill—that is general service; he may permit the installation of metres by a public utility corporation—that is not; or he may install his own metres and sell current and lamps—that is special service.

Consider these types of services:

Lighting: The current should be manufactured or bought wholesale and sold at a profit. Lamps should be handled likewise.
Heating: This is generally included in general service, but heating may be metred to ground floor-tenants and sold to neighboring properties.
Construction: The operation of this department is similar to any general contracting business. Work may be done on a cost-plus basis but to avoid disputes over details of cost it is most satisfactory to stipulate a sum.
Towel and cabinet service: This being a small individual consideration, it may effectively be controlled by lease and the aggregate business is profitable. This may be either linen or electric service.
Locker service.
Drinking-water.
Window-trimming and show-card writing.
Refrigeration: For restaurants, floral stands, confectioners, and ice-cream concerns.
Clock.
Patrol.
Luncheon service: Either complete or supplementary to home-prepared lunches.
Rug-cleaning.
Storage: Fireproof vaults and furniture storage.
Transfer and deliveries.
Garage.

The building manager, just as the chief executive of any going business, should be ever on the alert for profitable business expansion. In rendering special services he is reasonably correct in charging the profit which would be exacted by an outsider doing the work. Of course it is only the management of large structures which can assume the aspect of department-store service, but it is of importance that smaller buildings be as accurately organized for functioning in their particular field.

Like the small merchant, the manager of a small building is handicapped. By co-operation with other small building units and by determination of mutual standards, efficiency, economy, and more extensive service will emphatically become manifest. There is every reason for the standardization of service and supplies; it is the outgrowth of experience, the interchange of ideas and co-operative purchasing. Standardization means lower operating expense, and it is obtained by the use of the best available supplies and judicious handling of labor, made possible by power concentrated through quantity orders and distribution.

Tenantry

Getting back to simple fundamentals, the success of a structural enterprise is primarily dependent upon the law of supply and demand. This law controls the price and sale of floor space just as if it were any merchantable product.

The building manager who does not gouge competitive structures for tenants, and who realizes that his duty is more than renting space and collecting money; one who builds in terms of civic progress, and who renders a public and private service of which a community may be justly proud, it is to him that success will come by the psychical reaction upon his own property.

The manager is confronted first with the problem of tenanting his building and the proper selection of tenants; particularly ground-floor tenants. Good tenants attract good tenants, and the class of tenantry largely determines favorable or unfavorable publicity which stamps an impression upon the public mind and places the structure in a definite category.

A business attracting many people has decided advantages to the manager. Banks, for instance, draw crowds from the community as well as render a convenient service to the tenants. High-class restaurants, accommodations for luncheon clubs, rest-rooms, drug-stores, and conveniences catering to groups and many people are valuable. Well-known institutions constantly keep the name of the building and its location in the public mind and, therefore, advertise it. It is the prerogative of the building manager to devise ways and means of securing the particular class of tenants he desires.

In advertising a building for occupancy, building managers often apply these appeals, none of which alone is sufficient, but cumulatively efficient:

The Building:
- The architect.
- Artistic merit.
- Structural features.
- Equipment and conveniences.

Location:
- Proximity to business services.
- Access.
- Density of traffic.
- Corner influence.
- Transportation facilities.

Distribution of appropriate literature.
Newspaper publicity, billboards, display signs.
Community activities.
Formal openings.
The tenants themselves.
Service:
- Courtesy.
- Cleanliness.
- Managerial capability.
- Comforts.
- Time conservations.

Standards of service are first determined by prearranged architectural design and they vary in accordance with indigenous custom, individualistic requirements, and the ability of the manager skilfully to devise. Service is both direct and indirect; it is tangible and intangible, and there should never be any disposition on the part of the manager to slight service when either the tenant or the building profits by it. It usually pays to do more for the tenant than the lease requires, for this prescribes satisfaction and good-will, which keeps the building rented as well as maintains it in a rentable condition. Ultimately, profit is dependent upon contented tenants.

Only by the collaboration of the architect, by assiduous investigation of immediate administrative requisites, and the mastering of at least a workable knowledge of multivaried phases of business, can the building manager rise to the full powers of economic progress. The function of the architect is to render a highly specialized service embracing promotion, design, administration, and supervision of building construction; the function of the building manager is to advise during the entire period of creation, looking ever toward the dawn of that day when he will open his community-shop to market his wares of rental space, and by virtue of a meritorious vocation command tacit appreciation of technical performance commensurate with generous value.

Book Reviews

A HISTORY OF ENGLISH WALL PAPER, 1509–1914. By Alan Victor Sugden and John Ludlam Edmondson. With 70 plates in color and 190 illustrations in half-tone. Large quarto. Charles Scribner's Sons, Publishers, New York.

This is a beautifully made book; it might well be called sumptuous, with its handsome type pages and profusion of illustrations in both color and black and white. It tells the history of a great English industry, including sketches of famous manufacturers identified with it.

The custom of using printed paper apparently had its roots in Tudor times, following the custom of using tapestry or "arras."

No pains have been spared by the authors to explore every available source and to set down thoroughly the results of close and careful research extending over a number of years. In the full historical text it is shown that wall paper is at the end of a long series of humanity's devices to decorate its dwelling-place, which has its first beginnings in the Palæolithic cave paintings. After a reference to tapestry and painted cloth in mediæval times, the authors examine in detail the rare pieces of early wall paper, and set down all that can be gleaned about the earliest manufacturers; a classified list is appended of all important extant early specimens. The gradual growth of the craft is traced, with a reference to the interesting trade cards of the seventeenth and eighteenth centuries, a number of which are illustrated, with quotations from eighteenth-century trade transactions. The story is brought down to the nineteenth century, and there is a chapter on such famous designers as John Baptist Jackson, Bromwich, and other early London paper-stainers. The use of Chinese papers and their English versions also receives a due meed of attention. After the glowing age of the late Georgian period there was a decline, followed by the introduction of printing machinery later in the century. There is then the tide-mark of the great exhibition followed by the Gothic revivalists, such as B. J. Talbert, Pugin, Owen Jones, and others; afterwards we have the great artistic movement of the latter part of the nineteenth century set on foot by William Morris and continued by Walter Crane, Lewis F. Day, Sidney Haward, G. C. Haitè, and many others. The latest phase of the period under development brings in a number of able, versatile contemporary designers. The book concludes with a chapter on technical developments, and a series of mill records for reference.

Varied illustrations have been sought and collected with care and thought; they comprise 70 subjects in color and 190 illustrations from photographs or in line representing in all more than 260 specimens to a large size. The earliest examples are fully represented from extant fragments, and there is an excellent series of Chinese papers of Oriental and English origin. All the foregoing designers are illustrated by carefully selected characteristic specimens, and while the authors have not scrupled as a record to illustrate inferior periods, they have ensured that no work of really poor type is included. In addition sections of illustrations are devoted to friezes, embossed patterns, ceiling papers, etc., etc.

EAST CHRISTIAN ART—A SURVEY OF THE MONUMENTS. By O. M. Delton. Oxford University Press, American Branch, New York.

This is one of those monumental books that make manifest the fact that patient and accurate scholarship still have their place even in these modern days. Sacred art established by the church is early in evidence in any survey of East Christian and Byzantine art.

The primary purpose of church art was of course to illustrate facts for the general edification and emphasis of dogma.

Art was meant to be practical, but even the monks could not keep out of their work the impulse of the creative artist and the desire to make their work both decorative and alluring.

Christianity dealing with peoples of highly diversified training and mentality naturally gave expression to widely varied art ideals.

To trace these historically and to point out the particular manifestations in various countries is the purpose of this book.

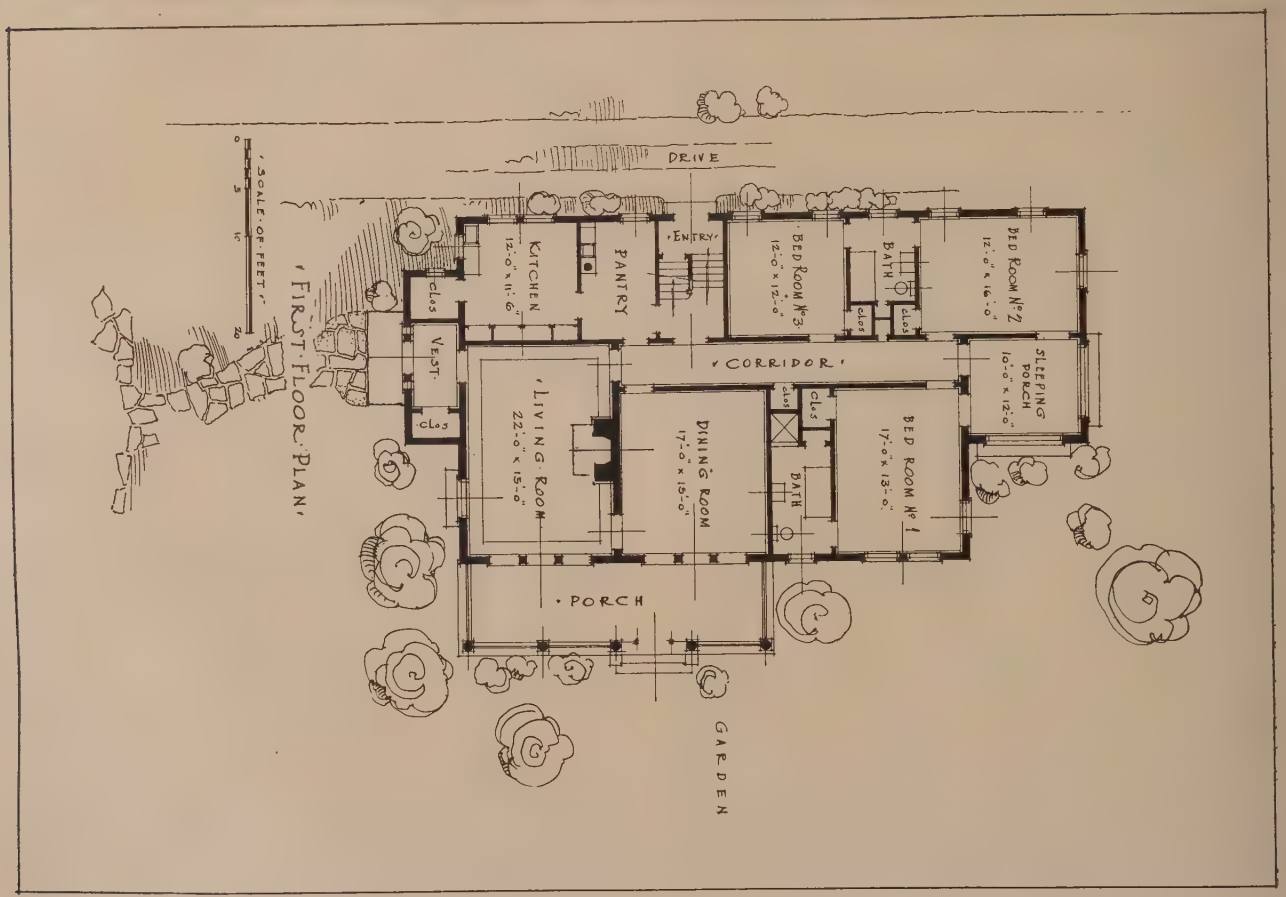
The chapter on architecture is especially interesting for what it has to say upon the origin and development of domical types.

"The aim has been to bring out certain dominant features and problems of development, rather than to repeat one of those condensed summaries which are already represented by such good and accessible examples. The subject has been treated from the historical point of view, with special reference to such problems as the origin and dissemination of domical types; detailed descriptions of particular buildings, which only those with architectural training can properly give, have not been attempted, and a survey of geographical distribution is added at the close. The illustration of the chapter is limited to general views, the principal object being to convey the character and variety of the buildings, and suggest comparison with those of other civilizations, not to provide plans and elevations in scale and number too limited to be of service, and better studied in books and monographs to which references are given."

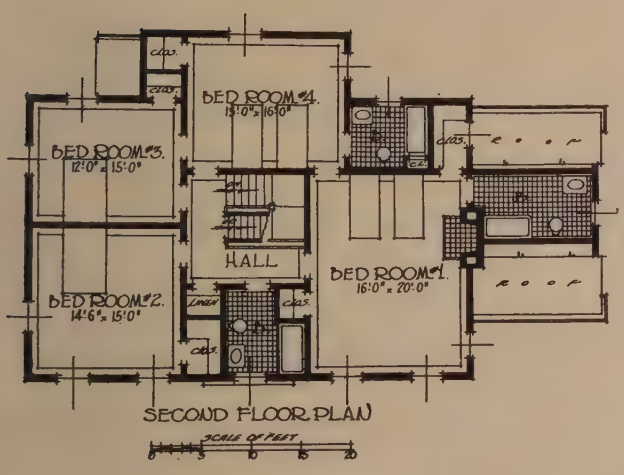
There are chapters on Sculpture and Painting and the Minor Arts, as well as Ornament. The illustrations are well chosen and include a frontispiece in color of the Porphyry Columns in the South-East Exedra, of the great church of S. Sophia at Constantinople.

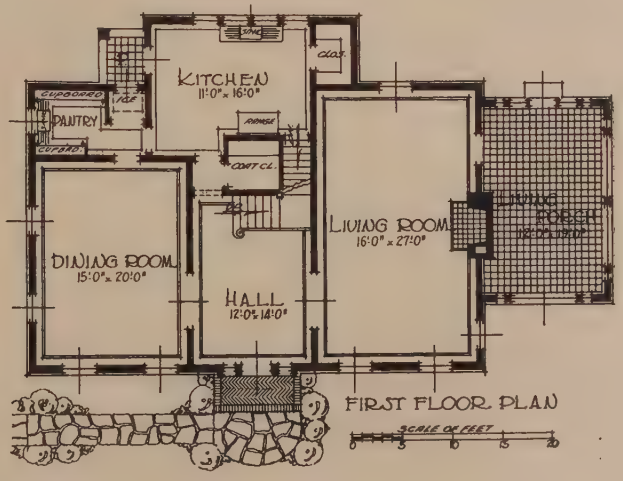
THE SMALLER ENGLISH HOUSE OF THE LATER RENAISSANCE 1660–1830. By A. E. Richardson, F.S.A., F.R.I.B.A., and Harold Donaldson Eberlein, B.A. William Hebburn, publisher, 418 Madison Avenue, New York.

The book comprises 250 pictures, all presented to a good scale to show detail clearly, and mostly reproduced from photographs specially taken or drawings specially made for the book. The photographic examples show a continuous series of the changing types of design from 1665–1830 in country and town houses, from small cottages to houses of moderate dimensions, and these are reinforced by a large number of Professor Richardson's sketches of elevations and bird's-eye views, culled from a variety of sources. These illustrations range over all parts of the country and a number are reproduced from contemporary prints and designs. One main feature is the attention devoted to the earliest phases of the late Renaissance, and the work of the Regency period, going well into the nineteenth century, which is now realized to possess much of character and interest. The section on Materials and Craftsmanship treats, with introductory text and well-selected illustrations, of every detail and feature of importance—Brickwork, Chimneys, Tile-hanging, Thatching, Weatherboarding, Windows, Doorways, and Doorheads, Ironwork Gates, Gatepiers, Treillage, Balconies, Fan-lights, Cornices, Shopfronts, Grates, &c. There is a series of 17 carefully prepared measured drawings and sketches, comprising about 100 specially chosen subjects of Features and Detail, and there are a number of photographs of Interiors and their features and accessories, and a comprehensive series of Plans.



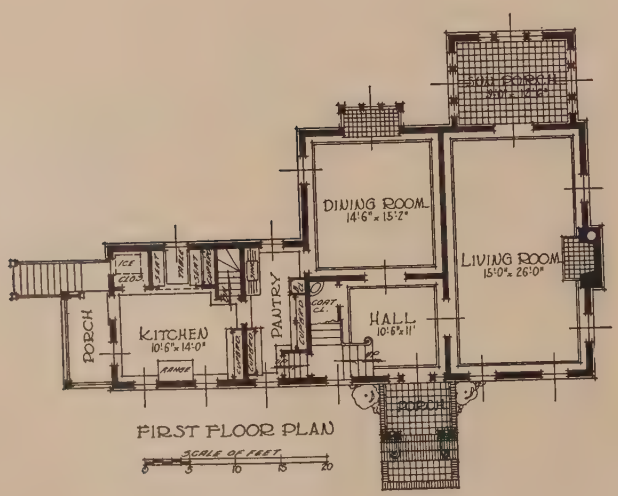
RESIDENCE, NEIL HIMEL, NEW ORLEANS, LA. Moise H. Goldstein, Architect.

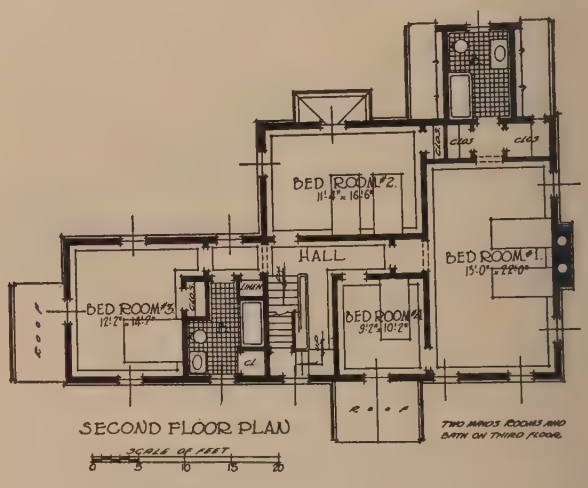




RESIDENCE, HAROLD S. GRAHAM, ENGLEWOOD, N. J.

R. C. Hunter & Bro., Architects.





RESIDENCE, WM. J. DEVINE, ENGLEWOOD, N. J.

R. C. Hunter & Bro., Architects.

The Economy of Bottom-Slab Construction

By DeWitt Clinton Pond

THERE is a type of floor construction that is being used in apartment-house and hotel construction somewhat different from those that have been referred to in previous articles. This is known as bottom-slab construction, and is shown in Fig. 1. The advantage of this type of floor lies in the fact that a flat ceiling is obtained in the rooms of apartments, and there are conditions where this is of very great importance, especially where loan organizations demand there shall be plaster cornices or coves in the ceilings of rooms where exposed beams occur.

The position of beams in Fig. 1 below the finished floor level was determined upon the fact that, although in most cases 8-inch beams would be used, there were cases in which 9-inch filler beams would be required, and these must not project below the general ceiling.

Now it is plain that construction of this type requires a greater amount of fill and consequently heavier steel than is necessary on the ordinary, or "top slab," floor, and the question which must be considered is whether the saving in plaster and for work is offset by the increased cost of steel or fill. If live loads are heavy and beams deep, then the fill increases to such an extent that the increased cost of fill and steel more than offsets any saving, but in residential buildings where the live load does not exceed 40 pounds, then there is a chance of effecting a saving as will be shown.

Another item of importance is the effect such construction would have on plumbing pipes that must be run below the floor finish. Because of the deep fill, the possibility of having all such pipes concealed without the need of furring is sure to effect a saving.

In general it is customary practice to have the bathroom-floor construction in apartment-houses carried by the bottom-slab type of floor. This has been the practice for several years, but recently, owing to the greater ease of treating the ceiling of living-rooms in hotels and other residential buildings, this type of construction has been used throughout. It is not difficult to see that where all beams are concealed, there need be no great attention paid to their location as far as architectural appearance is concerned, and the engineer can locate them in the most advantageous position for structural work. This relieves both the architect and engineer of a number of petty annoyances.

In order to consider just how this type of floor construction can be used, a problem that has been encountered in actual practice can be used. This problem deals with the type of floor construction to be used in a large hotel, where the loan company specified "living-rooms, bedrooms, and main foyers which have exposed beams are to have said beams treated with a cornice or cove."

The engineers were given a typical section of the floor plan for which they were to design the steel framing.

For the purpose of determining the different costs, a typical floor plan was selected having an area of 17,000 square feet, and as there were 13 floors on which the bottom-slab construction would occur, the total floor area to be concealed would contain 221,000 square feet.

Now, in the bathrooms it had been decided to use bottom-slab construction in any case, as this would be the least expensive method of concealing the pipes, and it was estimated that such areas would total 80,000 square feet, leaving 141,000 square feet of floor which might or might not be built of bottom or top slab construction.

In spite of the fact that at least 4 inches of fill were added in the case of bottom-slab construction, adding 20 pounds to the weight of the floor, it was found that this required only a very small amount of additional steel to carry it. The reason for this is shown in the following calculation:

Assuming that the average room measured 12 feet by 18 feet, and that girders were located so that they came in the partitions, then the simplest floor-panel framing would be such as shown in Fig. 2. The beams span only 12 feet, and are located 6 feet on centres. If the floor construction is as shown in Fig. 1, the floor load would be determined as follows:

1-inch finish	10 pounds
8½-inch fill	42 pounds
4-inch slab	36 pounds
1-inch plaster	5 pounds
Steel	3 pounds
Total	96 pounds

In this list of loads it might be noted that the haunch of cinder concrete over the beam is not accounted for, but as this would add only a very little to the total, it is hardly worth figuring.

The live load in residential buildings is 40 pounds per square foot, so the total load on the beams is 136 pounds. The beams span 12 feet and are 6 feet on centres, so the floor area that each beam carried is 72 square feet, and weighs $72 \times 136 = 9{,}792$ pounds. The steel handbooks, in tables of safe loads, state that a light 8-inch I-beam—weighing 17.5 pounds per foot—will carry this load.

If top-slab construction were used and approximately 6½ inches of fill were eliminated, the load could be reduced by 32 pounds per square foot, and the total unit load on the floor would be 104 pounds. $72 \times 104 = 7{,}488$ pounds is the load on each beam.

Again, by referring to the handbooks it will be seen that in place of an 8-inch beam a 7-inch beam can be used, weighing 15.3 pounds per foot, a difference of 2.2 pounds.

With regard to the girders, a similar saving can be shown. The unit load increases on these on account of partition loads and the weight of haunches. This load becomes 160 pounds per square foot in one case, and 128 in the other. While in the first case a 15-inch, 42-pound beam can be used for a girder without the additional fill, a 15-inch, 37.3-pound I-beam can be used, making a difference of 4.7 pounds per foot. The small beams are located 6 feet on centres, so the difference in weight per square foot of floor area can be formed by dividing 2.2 pounds by 6. $2.2 \div 6 = .37$ pounds of steel per square foot. The larger girders are located 18 feet on centres, and this difference per square foot is found to be $4.7 \div 18 = .26$ pounds. The total difference is .63 pounds.

For the sake of simplifying the figures and to be on the safe side, the total difference can be taken as six-tenths of a pound per foot.

Without designing the columns it would be impossible to determine accurately how much more steel will be required in these supports to carry the additional fill, but as it is generally conceded that 40 per cent of the steel in a

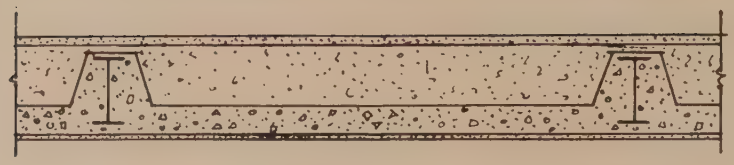


FIGURE 1
BOTTOM SLAB CONSTRUCTION

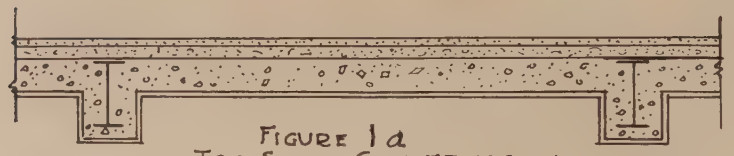


FIGURE 1a
TOP SLAB CONSTRUCTION

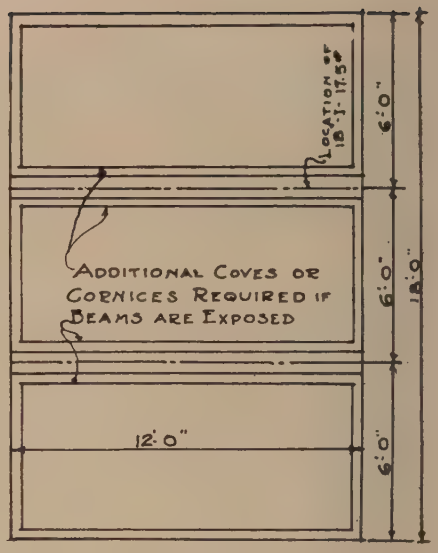


FIGURE 2

building is column steel and 60 per cent is floor steel, it is safe to say that four-tenths of a pound per square foot of floor area is added to the vertical members, making a total of one pound.

On the particular building under consideration the steel erectors took the contract on the basis of $92 a ton erected, and so one pound would cost 4.6 cents.

It is somewhat difficult to determine the actual cost of the additional fill, as this varies between 4 and 8 cents per foot, but it is probably safe to estimate that this cost will be 6 cents per foot, and therefore the total additional cost of steel and fill will be 10.6 cents per foot.

This must be offset by the cost of the additional plaster coves that must be used where exposed beams occur in the ceiling of the rooms. Fig. 3 shows the plan of the ceiling if top-slab construction is used, and it can be seen that there are two beams crossing the room and two at each end. In any case coves would be required around the entire room, so the only additional coves that would be required if the top-slab construction were employed would be those that would be added on the four sides of the exposed beams. These are 12 feet long, so there would be 48 lineal feet of coves required in addition. Figuring these at 20 cents per lineal foot, the cost would be $9.60 per room. In addition to this would be the plastering of the sides of the beams, which can be estimated at 25 cents per foot of beam. As there are 24 feet, this will cost $6, making a total of $15.60. A slight allowance should be made for plaster and cornice work where beams and girders intersect, so as the room contains 216 square feet, the cost of the additional coves and the plastering of the beams will be 7 cents per square foot of room.

This indicates that there will be an additional cost of 3.6 cents per square foot of floor if the bottom slab is used. As there will be 141,000 square feet of such floor construction, there will be an added cost for the entire building operation of over $5,000.

It can be seen that even under the most favorable circumstances, where light loads are encountered and short spans occur, the actual economy of the bottom-slab construction is questionable, although there can be no doubt but that there is a great advantage in maintaining a flat ceiling. As the total building operation in the above case would cost between $2,000,000 and $3,000,000, and the additional cost would be less than two-tenths of 1 per cent, the advantages might be worth the additional cost.

Incidentally, there might be less cost if the floor construction were based on a maximum depth of the filler beams of 8 inches, as determined. In this case one inch less fill would be required, and this might make the cost about the same for both cases.

From the above discussion it can be seen that if beams of greater depth than 9 inches are required, the added fill would be such as to make the cost prohibitive. So the point at which bottom-slab construction is economical seems to be at the point where the floor construction requires not more than 9-inch filler beams.

In case cornices are used in place of coves, there would be a smaller difference between the extra cost of the steel for bottom-slab construction and the cost of cornices that would have to be run in the plaster work in case the exposed beams were used. Cornices are estimated at 30 cents per lineal foot. There would be 48 feet of extra cornice in case the beams crossed the ceiling, making an additional cost of $4.40, or a cost per square foot of room of 9 cents. As the steel cost is 10.6 cents per foot, the difference in favor of top-slab construction is only 1.6 cents, making a total additional cost in the building of $141,000 \times 1.6 = \$2,260$, or about one-tenth of 1 per cent.

Of course, if no cornices or coves were used at all in the case of the flat ceiling, not even where the girders occur at the partitions, then the saving is all in favor of the bottom-slab construction, but it is improbable that coves would be required for these exposed beams, and at the ends only if they were not also required at the sides as well, so this seems to be only a theoretical consideration.

CONTACTS

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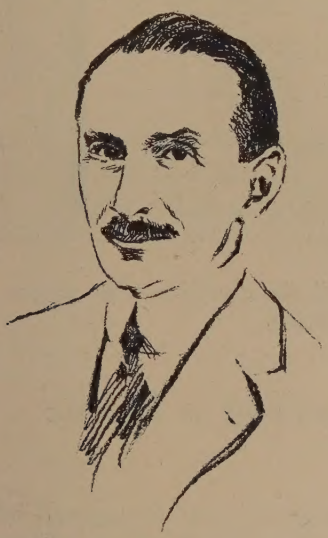
What Does a Job Cost the Architect?

The Actual and the Ideal Cost—Detailed Expenses for Various Parts of the Job—The Percentage of Commission—An Efficient Working Arrangement for the Office

By William Orr Ludlow
Of Ludlow & Peabody

WHETHER he makes money or loses money, it is clearly the duty of every architect to render the full service for which he is employed.

As the architect must make a living from his profession, he cannot afford to lose money on very many of his jobs. When he does lose money it is usually his

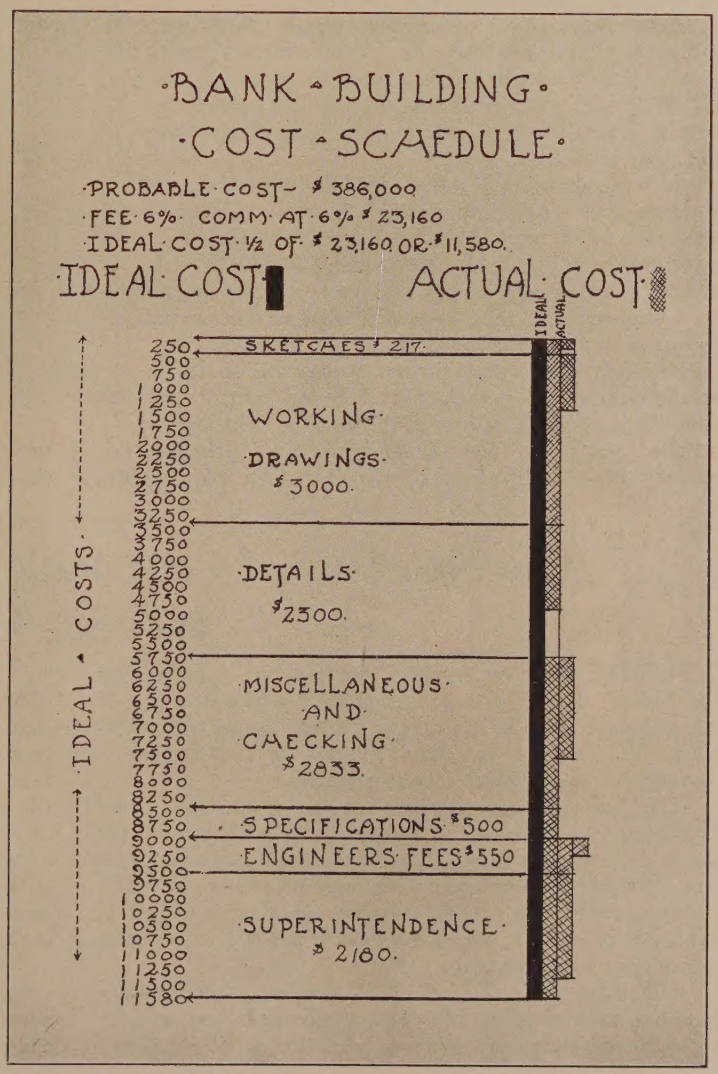


William Orr Ludlow

own fault—miscalculated the probable cost and agreed to accept too low a fee.

To avoid mistakes of this sort, the architect must keep accurate accounts showing not only what each job has cost him on completion, but what the various parts of each job have cost, how much he spent on preliminary sketches, how much on working drawings, specifications, details, superintendence. It is only from this data that he can calculate what the cost of any new piece of work is likely to be and what commission he can afford to charge.

The cost data referred to can, of course, be com-



(CONTACTS—*Continued*)

piled at the end of each job, *and there are architects, I am told, who have not the remotest idea whether they have made money or lost money until the fateful day when the returns are all in.*

But to know whether his office is working efficiently, whether there is waste in the production of drawings, whether too little or too much time is being spent on sketches or working drawings or details, the architect must know as his drawings progress what the work is costing in comparison to what it should cost.

With this in view I have found exceedingly helpful a diagrammatic record which shows all the facts at a glance.

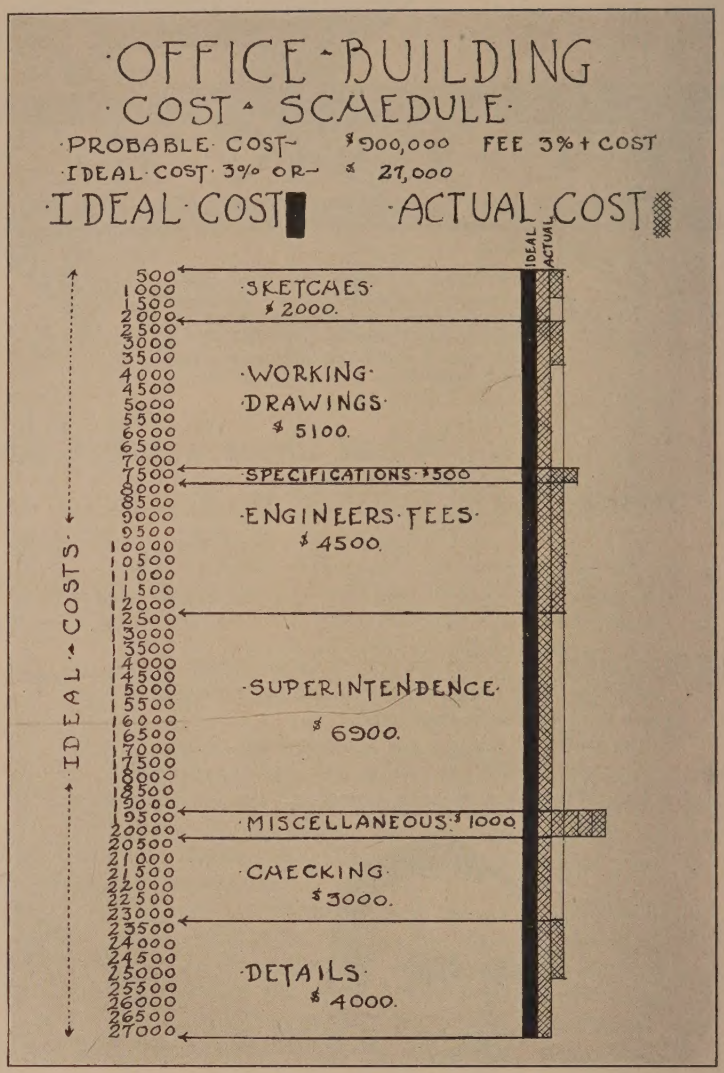
At the top of a sheet of cross-section paper is stated the probable cost of the building, the percentage of commission, and what part of the total commission should be allotted to cost, and what part to profits.

A heavy vertical red line is then drawn downward through as many squares as shall, by a determined value of each square, represent what the architect believes the various parts of the work should cost him; the total length of the red line representing, of course, the calculated total cost. For want of a better name, I call this the *ideal* cost, for although it may not always be attained, it is a criterion.

As the work in the office progresses, a yellow line, representing the *actual* cost of the work, is carried down, week by week, parallel to the red line, picturing not only what each part of the work has cost up to date but also how the actual cost is running in comparison with what it should.

This information, pictured graphically so that it can be read at a glance, not only helps the architect to keep track of his work, but also is a guide to the more important men in the drafting-room. It has also, I am convinced, a real educational value to these men.

I used to think that what the cost and the profits amounted to was nobody's business but my own. But it isn't often that an architect's profits are so large that he is ashamed of them, and I believe that there should be in every office not the spirit of the "old man" and the "draftsmen," but the spirit of "we." I believe this can only be brought about by the draftsmen knowing and taking interest in all the conditions that govern the work that they are producing.



The Necessity of Consultation in Planning a Home

By Rupert L. Burdick

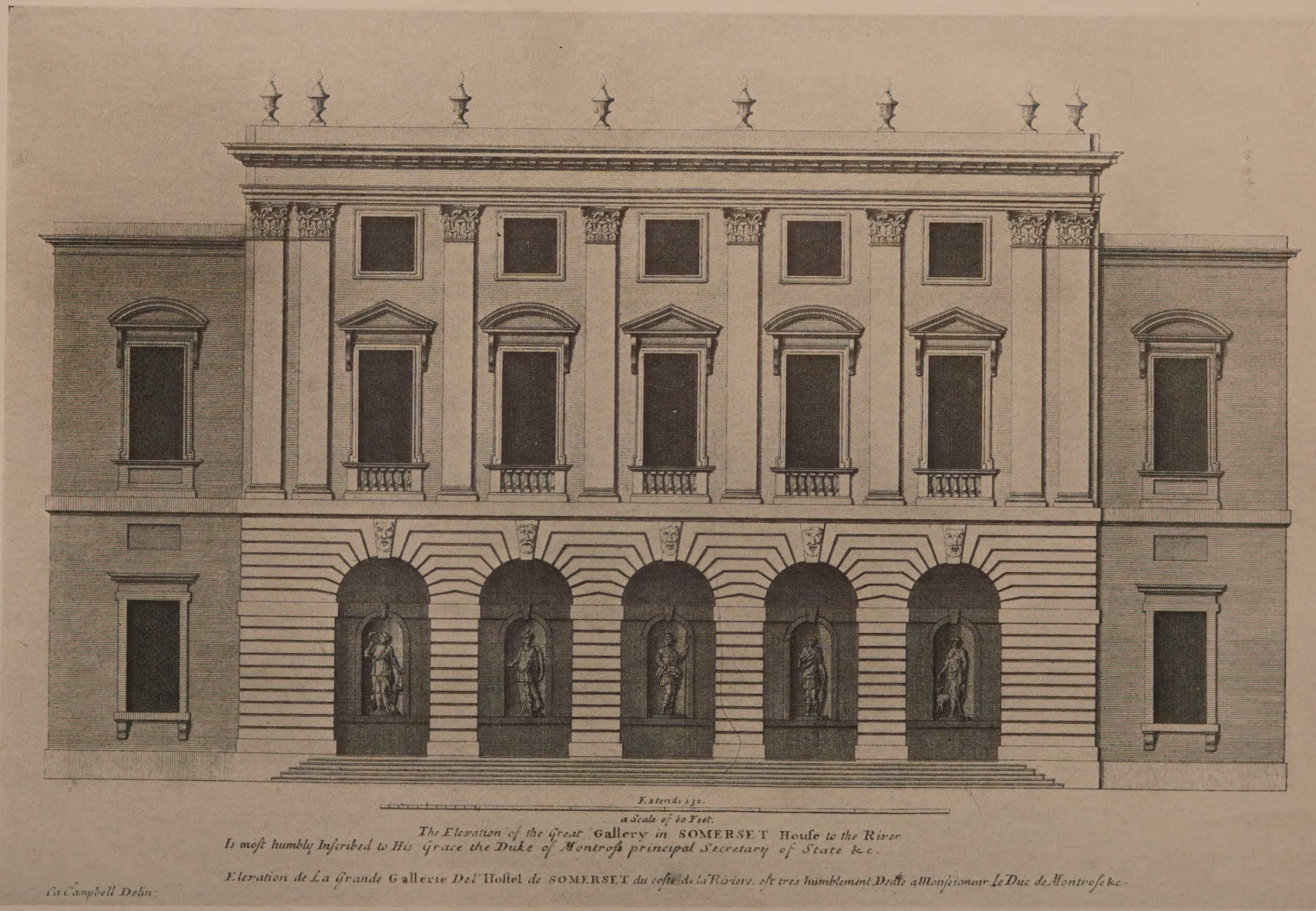
RECENTLY the writer had occasion to draw up an "ideal" layout of a residence to illustrate the proper and adequate installation of gas piping, flues, and appliances. To illustrate this clearly, it was decided to show a cross-section of a typical six-room house.

The design finally chosen was one of the syndicated plans widely broadcasted by an organization devoted to the interests of home-builders. A draftsman and a gas man were set to work placing the piping and appliances in these plans. The results were absurd—the flue connections had to be tied into knots in order to reach the flues if the appliances were to be placed most properly.

Abandoning this short-cut idea, the next scheme was to figure out an ideal piping, flue, and appliance layout in skeleton form and then draw a house plan around it—the outside dimensions and general room arrangement being determined first. When this work was begun, it was soon found that the living-room was about the size of a closet, the dining-room resembled a bowling-alley, two bedrooms could have been placed in the bathroom, and the sun-porch landed on the shady side of the house.

These two attempts are mentioned to emphasize the necessity for expert consultation on both sides of the business of planning a home—the architectural design for beauty and arrangement, and the technical modifications required for satisfactory installations for electricity, water, and gas.

I shall be frank enough to say that my experience with architects shows them to be several jumps ahead of the general run of utility companies in the understanding of the technical problems of the other fellow.



THE PROTOTYPE FOR HARRISON'S BRICK MARKET.

Engraving of old Somerset House in the "Vitruvius Britannicus," 1715.